CS6500 高等計算機圖學 (Advanced Computer Graphics)

Spring 2003

Classroom: 資電館 Room 129

Time: Tuesday 1:10 pm – 3:00 pm and Thursday 2:10 pm – 3:00 pm

Instructor: 張鈞法 (Chun-Fa Chang)

Office Hours: Appointment by email.

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Textbooks: Paper Collection**.**

References:

1. SIGGRAPH Proceedings (available online at ACM Digital Library).
2. SIGGRAPH 2001 Course Notes #24 "Real-time Shading"
3. SIGGRAPH 2001 Course Notes #43 "Performance Optimization for 3D Graphics"
4. Real Time Rendering (2nd Edition), by Eric Haines.
5. 3D Computer Graphics (3rd Edition), by Alan Watt.

Grading: Assignments: 30%, Paper Presentation: 30%, Project: 30%, Class Participation: 10%

Workload (subject to change):

1. **Programming Assignments**: There will be two or three: the first one is an OpenGL exercise and the second one is to render a large model as fast as possible. **Don't worry about its complexity**. Examples or pseudo codes will be available to make them easier and enjoyable to you.
2. **Written Assignments**: exercises such as the computation of Z-Buffer values and other interesting topics.
3. **Paper Presentation**: You are expected to study a technical paper thoroughly and present its ideas to the class.
4. **Project**: The class will be divided into teams of 2-3 persons, with each team working on a different project. **At the 9th week**, each team should finish the proposal. **At the 13th week**, each team will present the current progress. **Before the end of semester**, each team will present its results and demonstrate the finished product.

Topics and Schedule: (subject to change)

- Week 1: OpenGL Intro
- Week 2: The Mystic Z Values
- Week 3: Antialiasing and Sampling Theorem
- Week 4: Texture Mapping
- Week 5: Bump Mapping & Environment Mapping
- Week 6: Shadow
- Week 7: Space Partitioning
- Week 8: View Frustum Culling -- Cells & Portals
- Week 9: Occlusion Culling
- Week 10: Programmable Graphics Hardware
- Week 11: Introduction to Ray Tracing and Monte Carlo path tracing
- Paper Presentations (4-5 weeks)
- Project Progress Reports and Demos (2 week)