CSC0049 高等計算機圖學(Advanced Computer Graphics)

Fall 2024

http://140.122.185.90/AdvCG

Classroom: 公館校區研究大樓 S204
Time: Wednesday 9:10 – 12:10 pm
Instructor: 張鈞法 (Chun-Fa Chang)
Office Hours: Appointment by email.
Office: Room 508
Phone: (02) 7749-6688
Email: chunfa@ntnu·edu·tw

Textbooks/References:

1. Physically Based Rendering, by Matt Pharr and Greg Humphreys. (The eBook is available at https://www.pbr-book.org/ and the NTNU Library.)
2. Computer Graphics: Principles and Practice, 3rd Ed., by Hughes et al.
3. SIGGRAPH Proceedings and Courses (available online at ACM Digital Library).

Grading: Progamming Assignments: 40%, Paper Study & Reports: 20%, Final Project: 40%

Workload (subject to change):

1. **Programming Assignments**: There will be two or three parts to build a simple distributed ray tracer. **Don't worry about its complexity**. Examples or pseudo codes are available to make them easier and enjoyable to you.
2. **Paper Study & Reports**: During the second half of the course, we will adopt a flipped classroom approach. Reading will be assigned before each class meeting and a report will be due in class to foster the discussion. Each class will be concluded with the teacher's summary.
3. **Project**: The class will be divided into teams of 1-2 persons, with each team working on a different project. **At the 11th week**, each team should finish the proposal. **At the 14th 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):

- Overview and Introduction (1 week)
- OpenGL and graphics pipeline (1 weeks)
- Ray Tracing and Reflection Models (2 weeks)
- Spatial Partitions and Acceleration Structures (2 weeks)
- Radiosity (1 week)
- Environment Lighting and Indirect Lighting (2 weeks)
- Monte Carlo Path Tracing (3 weeks)
- Real-Time Global Illumination (2 week)
- Project Proposal and Demos (2-3 weeks)