

EE 7000-1 (Fall 2011) 3D Graphics and Visual Computing

Course Webpage: <http://www.ece.lsu.edu/xinli/teaching/EE7000Fall2011.htm>



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Course Description:

- To provide a knowledge on 3D computer graphics algorithms, techniques, and applications for modeling, simulation, animation, rendering and other key elements of visual computing.
- An advanced graduate course, but basic/necessary computer graphics knowledge will be briefly covered at the beginning.
- Good math background and programming skills could easily follow it.

Prerequisites:

- Calculus and linear algebra (vectors, matrices, ...)
- Programming experience: homework and projects require substantial programming effort (You are expected to know C/C++ programming and standard data structures)

Tentative Contents:

1. Basic computer graphics pipeline, basic OpenGL programming;
2. Basic 3D Representation and Modeling: how to store, represent, and render 3D geometric objects using triangle meshes;
3. Basic Geometry and Topology;
4. Graphics modeling system, Graphics User Interface design, build your own GUI,
5. Efficient Modeling: Multi-resolutional Representation (Progressive Meshes), Hierarchical Spatial Representation
6. Enhance your visual effects: Texture mapping, environmental mapping and rendering
7. Deformation and Animation: Free-form Deformation, Skeleton-driven Animation, Morphing, Collision Detection
8. Broader applications in visual computing: meshing; segmentation; shape analysis, comparison, recognition, and retrieval; ...

Homework and exams:

1. One warm-up assignment, four regular homework assignments (8+10+10+10+11);
2. One course project (with a midterm and final presentation), you will pick the topic and team up for it (8+8+15);
3. A Final Exam (20).

Textbook: (not required, slides will be provided)

OpenGL programming: "The OpenGL programming Guide":
http://www.opengl.org/documentation/red_book/