

EE 7700-1

Graphics Processors (GPUs)

(Schedule Booklet Title: ADV TOPICS COMP ENGR)

Where/When

3129 P. Taylor Hall, Mon. Wed. Fri. 12:40–13:30 **Spring 2009**

<http://www.ece.lsu.edu/gp/>

RSS: http://www.ece.lsu.edu/gp/rss_home.xml

Who

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Office hours: Monday–Friday: 9:00–10:00.

Prerequisites

By Course: Credit or registration in EE 4720 or equivalent.

By Topic: Computer architecture and digital logic must be thoroughly understood. Students must also have a familiarity machine language and C++ programming.

Topics

- Graphics Software/Hardware Organization
- Basics of 3D Computer Graphics
 - Transformations, projections, lighting kludges, textures, etc.
- GPU APIs: OpenGL, Direct3D
 - Coding projects using OpenGL and OpenGL Shader Language.
- Analysis of 3D Graphics Algorithms
 - Determination of computational and data-transfer needs.
 - Determination of control complexity and parallelism.
- Fixed-Function GPUs: Freezing the algorithm in hardware.
 - Exploitation of control simplicity and abundant parallelism.
 - Texture access techniques.
- Programmable GPUs: Flexibility without sacrificing FP density and latency tolerance.
 - Vertex, fragment, geometry, and unified “shader” ISA and microarchitectures.
 - Case studies of NVIDIA, ATI, and other companies’ products.
- Stream Processors, General-Purpose GPU (GPGPU)
 - GPGPU: Using a GPU for specialized non-graphical computation.
 - Stream Processors: Specialized processors similar to programmable GPUs.

Topics subject to change.

Text

Papers and other references. (No textbook.)

Grading

35% Midterm Exam • 35% Final Exam • 30% Homework and Projects

Final exam weight may be increased for a student who shows significant improvement on the final exam.

Late assignment penalty: 10% per day late deducted. Missed-midterm-exam policy: at instructor’s discretion either a makeup exam, use final exam grade for midterm grade (*i.e.*, 70% final exam weight), or use of zero for midterm grade. Daily attendance: optional, however students are responsible for all material, instructions, and notices presented in class.

