EE 7700-2: Graphics Processors (GPUs)

Where/When
3142 Taylor Hall, Monday Wednesday Friday 13:40–14:30, Spring 2008
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
  From airplanes to pixels.
• GPU APIs: OpenGL, Direct3D
  Coding projects using OpenGL.
• Analysis of 3D Graphics Algorithms
  Determination of floating-point and data-transfer needs.
  Determination of control complexity and parallelism.
• Fixed-Function GPUs: Freezing the algorithm in hardware.
  Exploitation of control simplicity and 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.