ST: CDA 6938: Multi-core/Many-core Architectures and Programming
Syllabus

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Description

The course teaches both the architecture of modern multi-core/many-core processors and the parallel programming principles to exploit the computational power of multi-core/many-core processors.

Lectures: F 10:30am ~ 1:15pm BA 0216
Office hours: F 2:30pm ~ 4:00pm, HEC 243

Course website: http://csl.cs.ucf.edu/courses/CDA6938/ (*check it often for updates*)

Reading/Supplementary Material (all optional textbooks)

GPU Gems 2: Programming Techniques for High Performance Graphics and General Purpose Computation edited by Matt Pharr, Addison-Wesley, ISBN 0-321-33559-7
GPU Gems 3 edited by H. Nguyen, Addison-Wesley, ISBN 0-321-51526-9
Patterns for Parallel Programming by T. G. Mattson, B. A. Sanders, and B. L. Massingill, Addison-Wesley, ISBN 0-321-22811-1
Multi-Core Programming: Increasing Performance through Software Multithreading, by S. Akhter and J. Roberts, Intel Press, ISBN 0-9764832-4-6
Research papers and lecture notes

Course Outline

Introduction to multi-core/many-core architecture
Introduction to multi-core/many-core programming
NVidia GPU architectures and the programming model for GPGPU (CUDA)
AMD/ATI GPU architectures and the programming model for GPGPU (CTM or Brook+)
IBM Cell BE architecture and the programming model for GPGPU
CPU/GPU trade-offs
Stream processors
Vector processors
Data-level parallelism and the associated programming patterns
Thread-level parallelism and the associated programming patterns
Future multi-core/many-core architectures
Future programming support for multi-core/many-core processors

Grading: +/- grading system will be used.

Homework assignments: 25%
In-class Presentation: 10%
Participation in discussion: 5%
Projects: 60% (including another in-class presentation for project results)

A:90~100 B+: 85~90 B: 80~85 B-: 75~80 C+:70~75 C: 65~70 C-:60~65 F:0~59