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)

Patterns for Parallel Programming by T. G. Mattson, B. A. Sanders, and B. L. Massingill, Addison-Wesley, ISBN 0-321-22811-1
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-: 75~70  C+: 70~75  C: 65~70  C-: 60~65  F: 0~59