Course Description for CSc 846: Systems Architecture

Course: CSc 846 Systems Architecture

Instructor: William Hsu

Semester first offered: Fall 2004

Textbook (tentative):

*Parallel computer architecture* by David Culler et al. (Morgan Kaufman)

References:

*Computer architecture* by John Hennessy and David Patterson (Morgan Kaufman)
*The Grid 2* by Ian Foster (Morgan Kaufman)
*Parallel Programming with MPI* by Peter Pacheco (Morgan Kaufman)

Prerequisite: grade of B or better in CSc 656, or consent of instructor

Background: The redesigned Computer Science graduate curriculum requires a course to cover architecture at the system level, to support students working in areas such as bioinformatics and distributed multimedia.

Objectives:

1) To provide an overview of the architecture of computer systems, with emphasis on large multiprocessor systems
2) To study aspects of interactions between hardware and software, in particular aspects that affect performance
3) To introduce parallel programming principles, languages and systems, provide hands-on experience in parallel/distributed computing
4) To examine characteristics, behavior and performance tuning of large applications

Description: Principles of computer systems architecture, with emphasis on hardware/software interactions for large applications and design for performance.

Topics:

Overview of processor and memory system architecture
Networking basics
High-performance input/output
Parallel and distributed computing
Parallel languages and tools
Application characteristics, behavior and testing
Performance modeling and measurement
Grading:  Quizzes (10%)
         Exams (50%)
         Projects (35%)
         Participation (5%)

Projects:  1) hands-on parallel programming project on multiprocessor system
           2) performance measurement and tuning project
           3) research paper and presentation