Parallel Programming using MPI:

Instructor:  S.-Y. Lee  
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Class:  MW 2:00 - 3:00 p.m.  Broun Hall 306

Office Hours:  MW 3:00 - 4:00 p.m.  (or by appointment)

Prerequisite:  ELEC2220, C programming (Unix)

Refs:  
Parallel Programming with MPI, Peter Pacheco, Morgan Kaufmann
Scalable Parallel Computing, Kai Hwang, McGraw Hill
Parallel Computer Architecture, Culler and Singh, Morgan Kaufmann
High Performance Computer Architecture, Harold Stone
Parallel and Distributed Computation, Bertsekas and Tsitsiklis
Introduction to Parallel Algorithms and Architectures, Leighton
Parallel Computing, Quinn
http://docs.sun.com

Plan:  
The basic materials on parallel computing, required for this course, will be covered first. They include system models, message passing, parallel computing systems, programming environment (MPI: message passing interface), task partitioning and load balancing, etc. Then, with a selected application (task), algorithm design, implementation, and performance analysis will be carried out. In this semester, the target task is matrix multiplication with emphasis on (dynamic) load balancing.

Each student is required to maintain a brief weekly record (log) of accomplishments, difficulties and plan for the following week, to submit monthly reports, and to participate in discussion and to give presentation as necessary at the weekly meeting. Each team needs to submit a proposal and a final report, and to give a final presentation at the end of semester.

Grading:  
Proposal 10 %
Progress reports (weekly logs and 2 monthly reports) 30 %
Participation and Presentation 20 %
Peer Review 10 %
Final report 30 %

Objectives:  
The following objectives will be emphasized in this course throughout the semester, especially in grading.

Application of knowledge on electrical and computing engineering
Professionalism (being organized and punctual, doing your best, etc.)
Cooperation among team members
Modularized, efficient and “readable” programs