CS-273 Foundations of Parallel and Network computing.

Course Information: Spring 2001.

Instructor: Satish Rao (satishr@cs.berkeley.edu; 642-4328) lecture TuTh 12:30-2:00 in 405 Soda Hall;

Newsgroup: ucb.class.cs273. Important messages concerning the class will be posted from time to time; all students are required to check the newsgroup frequently.

Web page: http://www.cs.berkeley.edu/~satishr/cs273/index.html. Lecture notes, homeworks and other documents will be posted here. Use this as a source for handouts.

Brief Overview

Fundamental theoretical issues in designing algorithms and architectures for parallel and network computing.

Shared memory models of parallel computation. Parallel algorithms. Routing algorithms for networks like hypercubes, meshes and butterfly. Contention resolution.

Fundamentals of routing for general networks. Algorithms for object location in distributed networks.

Readings.

Will be posted on the webpage.

Notes

We will have scribe notes. **Warning**: these notes will often be quite sketchy, and are **not** a substitute for attending the lectures.

Prerequisites

You should have taken an Upper Division course on algorithms (CS-170 or equivalent.)

Topics.

- PRAM model: Algorithms. Connected Components, P-completeness, straightline code.
- PRAM implementation. Hashing. Routing, combining in fixed connection networks. Ranade's routing/scheduling algorithm.
- More Network topics. Path selection, packet scheduling. Permutation routing. Switch scheduling for stability.
- Collision resolution. Optically computer model. Ethernet backoff protocols (perhaps.)
- Topics in network computing. Leader election. Routing with local information. Object location data structures for wide area networks.

Assessment

Each of you is required to produce one (or more) high quality set of scribe notes for a lecture.

The course will have problem sets and a final. The grade will be based 50% on problem sets and 50% on a final.

In the meantime, I will assign work on a class by class basis.

Welcome to the course!