6.846 – Parallel Computing (H)

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Grad-H Level, Spring 2010

TR 2:30-4:00PM in 4-237
Prerequisite: 6.004 or instructor permission
3-0-9
http://courses.csail.mit.edu/6.846
First class Tuesday, Feb. 2

"Think parallel or perish" announces a recent industry webinar on the future of software. This announcement reflects a recent disruptive shift from sequential computers to multicores in virtually every domain in the computing industry including desktops, laptops, clouds, cellphones, TVs, home media servers, networking systems, gaming machines, and automobiles. This course focuses on the hardware and software foundations of parallel computing.

Topics include:

- introduction to key multicore applications in scientific computing, networking and digital video
- parallel computing models including shared memory, streams, messaging
- parallel programming techniques
- VLSI technology review and multicore constraints
- communications and interconnection networks
- multicore caching and memory systems
- shared memory and cache coherence
- messaging
- multicore processor design
- synchronization
- performance evaluation methodologies

Programming contest on 64-core multicore

The course will comprise lectures, readings, homeworks, and projects.