INTRODUCTION TO PARALLEL AND DISTRIBUTED COMPUTING

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Various Aspects

Goal: application of concurrency to speed-up computations.

- Multi-core processors, multi-processors, computer clusters.
- Shared memory and distributed memory programming.
- Task parallel and data parallel algorithms.
- Strategies for parallel program design.
- Performance measures and analysis.

Various interrelated aspects (many of which we will discuss).
Course Topics

- Parallel Architectures
- *Auto-Parallelization and OpenMP*
- Performance Analysis
- *Multi-Threaded Client/Server Programming*
- Parallel Program Design
- *The Message Passing Interface MPI*
- Distributed Memory Algorithms

An overview of abstract development principles and concrete programming models.
Organization and Grades

- Moodle Course
  - Materials and links.
  - Forums for announcements and Q&A.
  - Submission of assignments.

- Four Assignments on Programming/Benchmarking
  - Automatic parallelization.
  - Shared memory programming in OpenMP.
  - Multi-threaded/networked programming in Java.
  - Distributed memory programming in MPI.

No exam, grade will be entirely based on assignments.
Literature

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Ian Foster: *Designing and Building Parallel Programs*, Addison-Wesley, 1995.