ALGORITHMS FOR PARALLEL AND DISTRIBUTED COMPUTATION

Information Sheet

Classes Meet: TTh 11:00 – 12:30, RLM 7.104


Instructor: Aristotle Arapostathis — Office: ENS 348B — Phone: 471-3265 Email: ari@mail.utexas.edu

Office Hours: TTh 2:00 – 4:00

Organization: No final, pending the Dean’s approval. A term project on research literature. Course evaluation during the last week of classes.

Grading Policy: Term project: 100%.

• Course also listed under the Computational and Applied Mathematics program as CAM 380N, unique 56345.

Main Topics

• Introduction: Models; complexity measures; parallelization of iterative methods; synchronization issues

• Algorithms for linear problems: Linear systems with special structure; classical iterative methods - parallel implementation; convergence analysis; the conjugate gradient method; Markov chains

• Nonlinear Problems: Contraction mappings; constrained and unconstrained optimization; parallelization techniques; variational inequalities

• Dynamic Programming: The shortest path problem; Markovian decision problems

• Network Flow Problems: The relaxation method; nonlinear flow problems

• Asynchronous algorithms: General convergence results; applications

Prerequisites

(a) An introductory course in Linear Algebra

(b) A course in Advanced Calculus or an undergraduate course in Real Analysis