

# Introduction To Parallel And Vector Scientific Computation

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In this introductory text, the fundamental algorithms of numerical linear algebra are developed in a parallel context. In this text, students of applied mathematics, science and engineering are introduced to fundamental ways of thinking about the broad context of parallelism. The authors begin by giving the reader a deeper understanding of the issues through a general examination of timing, data dependencies, and communication. These ideas are implemented with respect to shared memory, parallel and vector processing, and distributed memory cluster computing. Threads, OpenMP, and MPI are covered, along with code examples in Fortran, C, and Java. The principles of parallel computation are applied throughout as the authors cover traditional topics in a first course in scientific computing. Building on the fundamentals of floating point representation and numerical error, a thorough treatment of numerical linear algebra and eigenvector/eigenvalue problems is provided. By studying how these algorithms parallelize, the reader is able to explore parallelism inherent in other computations, such as Monte Carlo methods. EAN/ISBN : 9780511243431 Publisher(s): Cambridge University Press Format: ePub/PDF Author(s): Shonkwiler, Ronald W. - Lefton, Lew

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