



Introduction to Parallel Computing (2nd Edition)

By Ananth Grama, George Karypis, Vipin Kumar, Anshul Gupta

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Introduction to Parallel Computing is a complete end-to-end source of information on almost all aspects of parallel computing from introduction to architectures to programming paradigms to algorithms to programming standards. It is the only book to have complete coverage of traditional Computer Science algorithms (sorting, graph and matrix algorithms), scientific computing algorithms (FFT, sparse matrix computations, N-body methods), and data intensive algorithms (search, dynamic programming, data-mining).

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- Sales Rank: #689827 in Books
- Brand: Addison-Wesley Professional
- Published on: 2003-01-26
- Original language: English
- Number of items: 1
- Dimensions: 9.30" h x 1.70" w x 6.30" l, 2.28 pounds
- Binding: Hardcover
- 656 pages

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Editorial Review

From the Back Cover

Introduction to Parallel Computing, Second Edition

Ananth Grama

Anshul Gupta

George Karypis

Vipin Kumar

Increasingly, parallel processing is being seen as the only cost-effective method for the fast solution of computationally large and data-intensive problems. The emergence of inexpensive parallel computers such as commodity desktop multiprocessors and clusters of workstations or PCs has made such parallel methods generally applicable, as have software standards for portable parallel programming. This sets the stage for substantial growth in parallel software.

Data-intensive applications such as transaction processing and information retrieval, data mining and analysis and multimedia services have provided a new challenge for the modern generation of parallel platforms. Emerging areas such as computational biology and nanotechnology have implications for algorithms and systems development, while changes in architectures, programming models and applications have implications for how parallel platforms are made available to users in the form of grid-based services.

This book takes into account these new developments as well as covering the more traditional problems addressed by parallel computers. Where possible it employs an architecture-independent view of the underlying platforms and designs algorithms for an abstract model. Message Passing Interface (MPI), POSIX threads and OpenMP have been selected as programming models and the evolving application mix of parallel computing is reflected in various examples throughout the book.

* Provides a complete end-to-end source on almost every aspect of parallel computing (architectures, programming paradigms, algorithms and standards).

* Covers both traditional computer science algorithms (sorting, searching, graph, and dynamic programming algorithms) as well as scientific computing algorithms (matrix computations, FFT).

* Covers MPI, Pthreads and OpenMP, the three most widely used standards for writing portable parallel programs.

* The modular nature of the text makes it suitable for a wide variety of undergraduate and graduate level courses including parallel computing, parallel programming, design and analysis of parallel algorithms and high performance computing.

Ananth Grama is Associate Professor of Computer Sciences at Purdue University, working on various aspects of parallel and distributed systems and applications.

Anshul Gupta is a member of the research staff at the IBM T. J. Watson Research Center. His research areas are parallel algorithms and scientific computing.

George Karypis is Assistant Professor in the Department of Computer Science and Engineering at the University of Minnesota, working on parallel algorithm design, graph partitioning, data mining, and bioinformatics.

Vipin Kumar is Professor in the Department of Computer Science and Engineering and the Director of the Army High Performance Computing Research Center at the University of Minnesota. His research interests are in the areas of high performance computing, parallel algorithms for scientific computing problems and data mining.

Users Review

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