

Solve complex computing problems using parallel computing approaches

New!

Handbook of Parallel Computing

Models, Algorithms, and Applications

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John Reif • Duke University, Durham, North Carolina, USA

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A Thorough, State-of-the-Art Guide to Parallel Computing

The ability of parallel computing to process large data sets and handle time-consuming operations has resulted in unprecedented advances in biological and scientific computing, modeling, and simulations. Exploring these recent developments, the **Handbook of Parallel Computing: Models, Algorithms, and Applications** provides comprehensive coverage on all aspects of this field.

The first section of the book describes parallel models. It covers evolving computational systems, the decomposable bulk synchronous model, parallel random access machine-on-chip architecture, the parallel disks model, mobile agents, fault-tolerant computing, hierarchical performance modeling, the partitioned optical passive star network, and the reconfigurable mesh model. The subsequent section on parallel algorithms examines networks of workstations, grid and packet scheduling, the derandomization technique, isosurface extraction and rendering, suffix trees, and mobile computing algorithmics. The final part of the text highlights an array of problems and offers ways to combat these challenges.

This volume provides an up-to-date assessment of the models and algorithms involved in applying parallel computing to a variety of fields, from computational biology to wireless networking.

FEATURES

- Reviews recent advances in parallel computing, including membrane computing, the Inthreads model, atomic congestion games, multiprocessor scheduling algorithms for hard real-time systems, and new releases of the LAPACK and ScaLAPACK libraries
- Highlights a range of parallel computing problems, including latency, message dissemination, data transfer, call admission control, minimum energy communication, power aware scheduling, scalability, and data replication
- Presents numerous techniques and approaches to tackle these problems, including pipelines, I/O techniques, analytical modeling, orthogonal recursive bisection, game theory, and parallel matrix multiplication algorithms

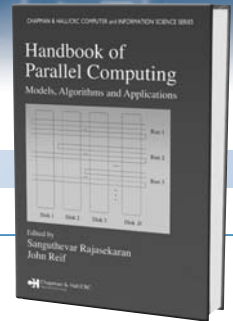
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