

High-Performance Scientific Computing

Algorithms and Applications

This book presents the state of the art in parallel numerical algorithms, applications, architectures, and system software. The book examines various solutions for issues of concurrency, scale, energy efficiency, and programmability, which are discussed in the context of a diverse range of applications. Features: includes contributions from an international selection of world-class authorities; examines parallel algorithm-architecture interaction through issues of computational capacity-based codesign and automatic restructuring of programs using compilation techniques; reviews emerging applications of numerical methods in information retrieval and data mining; discusses the latest issues in dense and sparse matrix computations for modern high-performance systems, multicores, manycores and GPUs, and several perspectives on the Spike family of algorithms for solving linear systems; presents outstanding challenges and developing technologies, and puts these in their historical context.

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106,99 €

99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781447124368

Medium: Buch

ISBN: 978-1-4471-2436-8

Verlag: Springer

Erscheinungstermin: 18.01.2012

Sprache(n): Englisch

Auflage: 2012

Produktform: Gebunden

Gewicht: 705 g

Seiten: 350

Format (B x H): 160 x 241 mm

