1. Record Nr. UNINA990000890340403321

Autore	Pun, Lucas
Titolo	Introduction to Optimization Practice
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Titolo	Parallel Algorithms in Computational Science and Engineering [[electronic resource] /] / edited by Ananth Grama, Ahmed H. Sameh
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Soggetti	Computer mathematics Algebras, Linear Computer science—Mathematics Numerical analysis Computational Science and Engineering Linear Algebra Mathematical Applications in Computer Science Numerical Analysis
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Nota di contenuto	State-of-the-Art Sparse Direct Solvers -- The Effect of Various Sparsity Structures on Parallelism and Algorithms to Reveal Those Structures -- Structure-Exploiting Interior Point Methods -- Parallel Hybrid Sparse Linear System Solvers -- Computational Material Science and Engineering -- Computational Cardiovascular Analysis with the Variational Multiscale Methods and Isogeometric Discretization -- ALE and Space-Time Variational Multiscale Isogeometric Analysis of Wind Turbines and Turbomachinery -- Variational Multiscale Flow Analysis in Aerospace, Energy, and Transportation Technologies -- Multiscale Crowd Dynamics Modeling and Safety Problems Towards Parallel Computing -- HPC for Weather Forecasting -- A Simple Study of Pleasing Parallelism on Multicore Computers -- Parallel Fast Time-Domain Integral-Equation Methods for Transient Electromagnetism Analysis -- Parallel Optimization Techniques for Machine Learning.
Sommario/riassunto	This contributed volume highlights two areas of fundamental interest in high-performance computing: core algorithms for important kernels and computationally demanding applications. The first few chapters explore algorithms, numerical techniques, and their parallel formulations for a variety of kernels that arise in applications. The rest of the volume focuses on state-of-the-art applications from diverse domains. By structuring the volume around these two areas, it presents a comprehensive view of the application landscape for high-performance computing, while also enabling readers to develop new applications using the kernels. Readers will learn how to choose the most suitable parallel algorithms for any given application, ensuring that theory and practicality are clearly connected. Applications using these techniques are illustrated in detail, including: Computational materials science and engineering Computational cardiovascular analysis Multiscale analysis of wind turbines and turbomachinery Weather forecasting Machine learning techniques Parallel Algorithms in Computational Science and Engineering will be an ideal reference for applied mathematicians, engineers, computer scientists, and other researchers who utilize high-performance computing in their work.