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| Nota di contenuto | HIGH-PERFORMANCE HETEROGENEOUS COMPUTING; CONTENTS; PREFACE; ACKNOWLEDGMENTS; PART I HETEROGENEOUS PLATFORMS: TAXONOMY, TYPICAL USES, AND PROGRAMMING ISSUES; 1. Heterogeneous Platforms and Their Uses; 1.1 Taxonomy of Heterogeneous Platforms; 1.2 Vendor-Designed Heterogeneous Systems; 1.3 Heterogeneous Clusters; 1.4 Local Network of Computers (LNC); 1.5 Global Network of Computers (GNC); 1.6 Grid-Based Systems; 1.7 Other Heterogeneous Platforms; 1.8 Typical Uses of Heterogeneous Platforms; 1.8.1 Traditional Use; 1.8.2 Parallel Computing; 1.8.3 Distributed Computing; 2. Programming Issues 2.1 Performance2.2 Fault Tolerance; 2.3 Arithmetic Heterogeneity; PART II PERFORMANCE MODELS OF HETEROGENEOUS PLATFORMS AND DESIGN OF HETEROGENEOUS ALGORITHMS; 3. Distribution of Computations with Constant Performance Models of Heterogeneous |

Processors; 3.1 Simplest Constant Performance Model of Heterogeneous Processors and Optimal Distribution of Independent Units of Computation with This Model; 3.2 Data Distribution Problems with Constant Performance Models of Heterogeneous Processors; 3.3 Partitioning Well-Ordered Sets with Constant Performance Models of Heterogeneous Processors
3.4 Partitioning Matrices with Constant Performance Models of Heterogeneous Processors4. Distribution of Computations with Nonconstant Performance Models of Heterogeneous Processors; 4.1 Functional Performance Model of Heterogeneous Processors; 4.2 Data Partitioning with the Functional Performance Model of Heterogeneous Processors; 4.3 Other Nonconstant Performance Models of Heterogeneous Processors; 4.3.1 Stepwise Functional Model; 4.3.2 Functional Model with Limits on Task Size; 4.3.3 Band Model; 5. Communication Performance Models for High-Performance Heterogeneous Platforms
5.1 Modeling the Communication Performance for Scientific Computing: The Scope of Interest5.2 Communication Models for Parallel Computing on Heterogeneous Clusters; 5.3 Communication Performance Models for Local and Global Networks of Computers; 6. Performance Analysis of Heterogeneous Algorithms; 6.1 Efficiency Analysis of Heterogeneous Algorithms; 6.2 Scalability Analysis of Heterogeneous Algorithms; PART III PERFORMANCE: IMPLEMENTATION AND SOFTWARE; 7. Implementation Issues; 7.1 Portable Implementation of Heterogeneous Algorithms and Self-Adaptable Applications
7.2 Performance Models of Heterogeneous Platforms: Estimation of Parameters7.2.1 Estimation of Constant Performance Models of Heterogeneous Processors; 7.2.2 Estimation of Functional and Band Performance Models of Heterogeneous Processors; 7.2.3 Benchmarking of Communication Operations; 7.3 Performance Models of Heterogeneous Algorithms and Their Use in Applications and Programming Systems; 7.4 Implementation of Homogeneous Algorithms for Heterogeneous Platforms; 8. Programming Systems for High-Performance Heterogeneous Computing; 8.1 Parallel Programming Systems for Heterogeneous Platforms
8.2 Traditional Parallel Programming Systems

Sommario/riassunto

An analytical overview of the state of the art, open problems, and future trends in heterogeneous parallel and distributed computing This book provides an overview of the ongoing academic research, development, and uses of heterogeneous parallel and distributed computing in the context of scientific computing. Presenting the state of the art in this challenging and rapidly evolving area, the book is organized in five distinct parts: Heterogeneous Platforms: Taxonomy, Typical Uses, and Programming Issues Performance Models of Heterogeneous Platforms and Design of¿Heterogeneous