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# Foundations Of Multithreaded Parallel And Distributed Programming Pdf

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8th International Conference, POST 2019, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2019, Prague, Czech Republic, April 6–11, 2019, Proceedings

Architectures, Algorithms, and Applications

A New Class of Algorithms

From Algorithms to Programming on State-of-the-Art Platforms

Mathematical Foundations of Data Science Using R

Parallel Processing for Scientific Computing

Design Principles and Patterns

Multithreaded Programming with Java Technology

Foundations and Applications Programming

Intel Threading Building Blocks

Learning Concurrent Programming in Scala

Introduction to Parallel Computing

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The Future of Computing Performance

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Parallel Metaheuristics

A Cyber-Physical Systems Approach

Implementing, Testing, and Debugging Multithreaded Java and C++/Pthreads/Win32 Programs

Concurrency in Practice

Embedded Systems Foundations of Cyber-Physical Systems

Design of Multithreaded Software

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High Performance Computing Systems and Applications

Modern Computational Finance

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The Bulgarian C# Book

Windows Presentation Foundation 4.5 Cookbook

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A Practical Approach to High-Performance Computing

Patterns for Parallel Software Design

Concurrency in C# Cookbook

Parallel Computer Organization and Design

Introduction to Parallel Computing

Applied Parallel Computing

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Portable Shared Memory Parallel Programming

JavaScript Concurrency

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*8th International Conference, POST 2019, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2019, Prague, Czech Republic, April 6-11, 2019, Proceedings* MIT Press

CUDA is a computing architecture designed to facilitate the development of parallel programs. In conjunction with a comprehensive software platform, the CUDA Architecture enables programmers to draw on the immense power of graphics processing units (GPUs) when building high-performance applications. GPUs, of course, have long been available for demanding graphics and game applications. CUDA now brings this valuable resource to programmers working on applications in other domains, including science, engineering, and finance. No knowledge of graphics programming is required—just the ability to program in a modestly extended version of C. *CUDA by Example*, written by two senior members of the CUDA software platform team, shows programmers how to employ this new technology. The authors introduce each area of CUDA development through working examples. After a concise introduction to the CUDA platform and architecture, as well as a quick-start guide to CUDA C, the book details the techniques and trade-offs associated with each key CUDA feature. You'll discover when to use each CUDA C extension and how to write CUDA software that delivers truly outstanding performance. Major topics covered include Parallel programming Thread cooperation Constant memory and events Texture memory Graphics interoperability Atomics Streams CUDA C on multiple GPUs Advanced atomics Additional CUDA resources All the CUDA software tools you'll need are freely available for download from NVIDIA.

<http://developer.nvidia.com/object/cuda-by-example.html>

*Architectures, Algorithms, and Applications* John Wiley & Sons

This book contains a selection of refereed and revised papers of the Intelligent Distributed Computing Track originally presented at the third International Symposium on Intelligent Informatics (ISI-2014), September 24-27, 2014, Delhi, India. The papers selected for this Track cover several Distributed Computing and related topics including Peer-to-Peer Networks, Cloud Computing, Mobile Clouds, Wireless Sensor Networks, and their applications.

*A New Class of Algorithms* John Wiley & Sons

Teaching fundamental design concepts and the challenges of emerging technology, this textbook prepares students for a career designing the computer systems of the future. In-depth coverage of complexity, power, reliability and performance, coupled with treatment of parallelism at all levels, including ILP and TLP, provides the state-of-the-art training that students need. The whole gamut of parallel architecture design options is explained, from core microarchitecture to chip multiprocessors to large-scale multiprocessor systems. All the chapters are self-contained, yet concise enough that the material can be taught in a single semester, making it perfect for use in senior undergraduate and graduate computer architecture courses. The book is also teeming with

practical examples to aid the learning process, showing concrete applications of definitions. With simple models and codes used throughout, all material is made open to a broad range of computer engineering/science students with only a basic knowledge of hardware and software.

**From Algorithms to Programming on State-of-the-Art Platforms** Morgan Kaufmann

*Distributed and Cloud Computing: From Parallel Processing to the Internet of Things* offers complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing. It is the first modern, up-to-date distributed systems textbook; it explains how to create high-performance, scalable, reliable systems, exposing the design principles, architecture, and innovative applications of parallel, distributed, and cloud computing systems. Topics covered by this book include: facilitating management, debugging, migration, and disaster recovery through virtualization; clustered systems for research or ecommerce applications; designing systems as web services; and social networking systems using peer-to-peer computing. The principles of cloud computing are discussed using examples from open-source and commercial applications, along with case studies from the leading distributed computing vendors such as Amazon, Microsoft, and Google. Each chapter includes exercises and further reading, with lecture slides and more available online. This book will be ideal for students taking a distributed systems or distributed computing class, as well as for professional system designers and engineers looking for a reference to the latest distributed technologies including cloud, P2P and grid computing. Complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing Includes case studies from the leading distributed computing vendors: Amazon, Microsoft, Google, and more Explains how to use virtualization to facilitate management, debugging, migration, and disaster recovery Designed for undergraduate or graduate students taking a distributed systems course—each chapter includes exercises and further reading, with lecture slides and more available online

*Mathematical Foundations of Data Science Using R* Addison-Wesley

Until the late 1980s, information processing was associated with large mainframe computers and huge tape drives. During the 1990s, this trend shifted toward information processing with personal computers, or PCs. The trend toward miniaturization continues and in the future the majority of information processing systems will be small mobile computers, many of which will be embedded into larger products and interfaced to the physical environment. Hence, these kinds of systems are called embedded systems. Embedded systems together with their physical environment are called cyber-physical systems. Examples include systems such as transportation and fabrication equipment. It is expected that the total market volume of embedded systems will be significantly larger than that of traditional information processing systems such as PCs and mainframes. Embedded systems share a number of common characteristics. For example, they must be dependable, efficient, meet real-time constraints and require customized user interfaces (instead of generic keyboard and mouse interfaces). Therefore, it makes sense to consider common principles of embedded system design. *Embedded System Design* starts with an introduction into the area and

a survey of specification models and languages for embedded and cyber-physical systems. It provides a brief overview of hardware devices used for such systems and presents the essentials of system software for embedded systems, like real-time operating systems. The book also discusses evaluation and validation techniques for embedded systems. Furthermore, the book presents an overview of techniques for mapping applications to execution platforms. Due to the importance of resource efficiency, the book also contains a selected set of optimization techniques for embedded systems, including special compilation techniques. The book closes with a brief survey on testing. Embedded System Design can be used as a text book for courses on embedded systems and as a source which provides pointers to relevant material in the area for PhD students and teachers. It assumes a basic knowledge of information processing hardware and software. Courseware related to this book is available at <http://ls12-www.cs.tu-dortmund.de/~marwedel>.

Parallel Processing for Scientific Computing Faber Publishing

Here is a programmer's guide to using and programming POSIX threads, commonly known as Pthreads. A "coder's book", this title tells how to use Pthreads in the real world, making efficient and portable applications. Pthreads are an important set of current tools programmers need to have in today's network-intensive climate.

*Design Principles and Patterns* Packt Publishing Ltd

Build better software with concurrent JavaScript programming, and unlock a more efficient and forward thinking approach to web development About This Book Apply the core principles of concurrency to both browser and server side development Explore the latest tools and techniques at the forefront of concurrent programming, including JavaScript promises, web workers, and generators Learn how concurrent and parallel programming can help you tackle the challenges of fast, data heavy web development Who This Book Is For JavaScript Concurrency is written for any JavaScript developer who wants to learn how to write more efficient, powerful, and maintainable applications that utilize the latest developments in the JavaScript language. All aspects of concurrent, asynchronous, and parallel programming are covered from first principles and by the end of the book you'll be able to create a fully-worked application that leverages all the topics covered in the book. What You Will Learn Understand exactly how JavaScript works in a web browser environment, and how these mechanisms power our event-driven JavaScript code Use promises to turn complex synchronization scenarios into readable and maintainable values Compute values lazily and avoid unnecessary memory allocations using generators. Write concurrent code that doesn't feel like concurrent code by abstracting away boilerplate chores Leverage true hardware parallelism with web workers to get a better performance Get to grips with the NodeJS model of concurrency and learn why it's good for I/O-intensive web applications In Detail Concurrent programming may sound abstract and complex, but it helps to deliver a better user experience. With single threaded JavaScript, applications lack dynamism. This means that when JavaScript code is running, nothing else can happen. The DOM can't update, which means the UI freezes. In a world where users expect speed and responsiveness - in all senses of the word - this is something no developer can afford. Fortunately, JavaScript has evolved to adopt concurrent capabilities - one of the reasons why it is still at the forefront of modern web development. This book helps you dive into concurrent JavaScript, and demonstrates how to apply its core principles and key techniques and

tools to a range of complex development challenges. Built around the three core principles of concurrency - parallelism, synchronization, and conservation - you'll learn everything you need to unlock a more efficient and dynamic JavaScript, to lay the foundations of even better user experiences. Throughout the book you'll learn how to put these principles into action by using a range of development approaches. Covering everything from JavaScript promises, web workers, generators and functional programming techniques, everything you learn will have a real impact on the performance of your applications. You'll also learn how to move between client and server, for a more frictionless and fully realized approach to development. With further guidance on concurrent programming with Node.js, JavaScript Concurrency is committed to making you a better web developer. The best developers know that great design is about more than the UI - with concurrency, you can be confident every your project will be expertly designed to guarantee its dynamism and power. Style and approach Beginning with the fundamentals of concurrency and how they apply to JavaScript development, the book then takes you through the relevant constructs that will help you implement concurrent code. You'll learn how even the most abstract and theoretical aspects of concurrent programming help you solve real world challenges, with clear and practical demonstrations that show you how concurrent JavaScript will make you a better developer.

*Multithreaded Programming with Java Technology* Elsevier

Summary Functional Programming in Scala is a serious tutorial for programmers looking to learn FP and apply it to the everyday business of coding. The book guides readers from basic techniques to advanced topics in a logical, concise, and clear progression. In it, you'll find concrete examples and exercises that open up the world of functional programming. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Functional programming (FP) is a style of software development emphasizing functions that don't depend on program state. Functional code is easier to test and reuse, simpler to parallelize, and less prone to bugs than other code. Scala is an emerging JVM language that offers strong support for FP. Its familiar syntax and transparent interoperability with Java make Scala a great place to start learning FP. About the Book Functional Programming in Scala is a serious tutorial for programmers looking to learn FP and apply it to their everyday work. The book guides readers from basic techniques to advanced topics in a logical, concise, and clear progression. In it, you'll find concrete examples and exercises that open up the world of functional programming. This book assumes no prior experience with functional programming. Some prior exposure to Scala or Java is helpful. What's Inside Functional programming concepts The whys and hows of FP How to write multicore programs Exercises and checks for understanding About the Authors Paul Chiusano and Rúnar Bjarnason are recognized experts in functional programming with Scala and are core contributors to the Scalaz library. Table of Contents PART 1 INTRODUCTION TO FUNCTIONAL PROGRAMMING What is functional programming? Getting started with functional programming in Scala Functional data structures Handling errors without exceptions Strictness and laziness Purely functional state PART 2 FUNCTIONAL DESIGN AND COMBINATOR LIBRARIES Purely functional parallelism Property-based testing Parser combinators PART 3 COMMON STRUCTURES IN FUNCTIONAL DESIGN Monoids Monads Applicative and traversable functors PART 4 EFFECTS AND I/O External effects and I/O Local effects and mutable state Stream processing and incremental I/O

*Foundations and Applications Programming* Cambridge University Press

The free book "Fundamentals of Computer Programming with C#" is a comprehensive computer programming tutorial that teaches programming, logical thinking, data structures and algorithms, problem solving and high quality code with lots of examples in C#. It starts with the first steps in programming and software development like variables, data types, conditional statements, loops and arrays and continues with other basic topics like methods, numeral systems, strings and string processing, exceptions, classes and objects. After the basics this fundamental programming book enters into more advanced programming topics like recursion, data structures (lists, trees, hash-tables and graphs), high-quality code, unit testing and refactoring, object-oriented principles (inheritance, abstraction, encapsulation and polymorphism) and their implementation the C# language. It also covers fundamental topics that each good developer should know like algorithm design, complexity of algorithms and problem solving. The book uses C# language and Visual Studio to illustrate the programming concepts and explains some C# / .NET specific technologies like lambda expressions, extension methods and LINQ. The book is written by a team of developers lead by Svetlin Nakov who has 20+ years practical software development experience. It teaches the major programming concepts and way of thinking needed to become a good software engineer and the C# language in the meantime. It is a great start for anyone who wants to become a skillful software engineer. The books does not teach technologies like databases, mobile and web development, but shows the true way to master the basics of programming regardless of the languages, technologies and tools. It is good for beginners and intermediate developers who want to put a solid base for a successful career in the software engineering industry. The book is accompanied by free video lessons, presentation slides and mind maps, as well as hundreds of exercises and live examples. Download the free C# programming book, videos, presentations and other resources from <http://introprogramming.info>. Title: Fundamentals of Computer Programming with C# (The Bulgarian C# Programming Book) ISBN: 9789544007737 ISBN-13: 978-954-400-773-7 (9789544007737) ISBN-10: 954-400-773-3 (9544007733) Author: Svetlin Nakov & Co. Pages: 1132 Language: English Published: Sofia, 2013 Publisher: Faber Publishing, Bulgaria Web site: <http://www.introprogramming.info> License: CC-Attribution-Share-Alike Tags: free, programming, book, computer programming, programming fundamentals, ebook, book programming, C#, CSharp, C# book, tutorial, C# tutorial; programming concepts, programming fundamentals, compiler, Visual Studio, .NET, .NET Framework, data types, variables, expressions, statements, console, conditional statements, control-flow logic, loops, arrays, numeral systems, methods, strings, text processing, StringBuilder, exceptions, exception handling, stack trace, streams, files, text files, linear data structures, list, linked list, stack, queue, tree, balanced tree, graph, depth-first search, DFS, breadth-first search, BFS, dictionaries, hash tables, associative arrays, sets, algorithms, sorting algorithm, searching algorithms, recursion, combinatorial algorithms, algorithm complexity, OOP, object-oriented programming, classes, objects, constructors, fields, properties, static members, abstraction, interfaces, encapsulation, inheritance, virtual methods, polymorphism, cohesion, coupling, enumerations, generics, namespaces, UML, design patterns, extension methods, anonymous types, lambda expressions, LINQ, code quality, high-quality code, high-quality classes, high-quality methods, code formatting, self-documenting code, code refactoring, problem solving, problem

solving methodology, 9789544007737, 9544007733

Springer Nature

This book constitutes the thoroughly refereed post-proceedings of the 8th International Workshop on Applied Parallel Computing, PARA 2006. It covers partial differential equations, parallel scientific computing algorithms, linear algebra, simulation environments, algorithms and applications for blue gene/L, scientific computing tools and applications, parallel search algorithms, peer-to-peer computing, mobility and security, algorithms for single-chip multiprocessors.

Intel Threading Building Blocks "O'Reilly Media, Inc."

Foundations of Multithreaded, Parallel, and Distributed Programming Pearson

**Learning Concurrent Programming in Scala** Springer Science & Business Media

This book assumes familiarity with threads (in a language such as Ada, C#, or Java) and introduces the entity-life modeling (ELM) design approach for certain kinds of multithreaded software. ELM focuses on "reactive systems," which continuously interact with the problem environment. These "reactive systems" include embedded systems, as well as such interactive systems as cruise controllers and automated teller machines. Part I covers two fundamentals: program-language thread support and state diagramming. These are necessary for understanding ELM and are provided primarily for reference. Part II covers ELM from different angles. Part III positions ELM relative to other design approaches.

Introduction to Parallel Computing John Wiley & Sons

Solving complex optimization problems with parallelmetaheuristics Parallel Metaheuristics brings together an international group of experts in parallelism and metaheuristics to provide a much-needed synthesis of these two fields. Readers discover how metaheuristic techniques can provide useful and practical solutions for a widerange of problems and application domains, with an emphasis on the fields of telecommunications and bioinformatics. This volume fills a long-existing gap, allowing researchers and practitioners to develop efficient metaheuristic algorithms to find solutions. The book is divided into three parts: \* Part One: Introduction to Metaheuristics and Parallelism, including an Introduction to Metaheuristic Techniques, Measuring the Performance of Parallel Metaheuristics, New Technologies in Parallelism, and a head-to-head discussion on Metaheuristics and Parallelism \* Part Two: Parallel Metaheuristic Models, including Parallel Genetic Algorithms, Parallel Genetic Programming, Parallel Evolution Strategies, Parallel Ant Colony Algorithms, Parallel Estimation of Distribution Algorithms, Parallel Scatter Search, Parallel Variable Neighborhood Search, Parallel Simulated Annealing, Parallel Tabu Search, Parallel GRASP, Parallel Hybrid Metaheuristics, Parallel Multi-Objective Optimization, and Parallel Heterogeneous Metaheuristics \* Part Three: Theory and Applications, including Theory of Parallel Genetic Algorithms, Parallel Metaheuristics Applications, Parallel Metaheuristics in Telecommunications, and a final chapter on Bioinformatics and Parallel Metaheuristics Each self-contained chapter begins with clear overviews and introductions that bring the reader up to speed, describes basic techniques, and ends with a reference list for further study. Packed with numerous tables and figures to illustrate the complex theory and processes, this comprehensive volume also includes numerous practical real-world optimization problems and their solutions. This is essential reading for students and researchers in computer science, mathematics, and engineering who deal with

parallelism, metaheuristics, and optimization in general.

[Functional Programming in Scala](#) "O'Reilly Media, Inc."

In order best exploit the incredible quantities of data being generated in most diverse disciplines data sciences increasingly gain worldwide importance. The book gives the mathematical foundations to handle data properly. It introduces basics and functionalities of the R programming language which has become the indispensable tool for data sciences. Thus it delivers the reader the skills needed to build own tool kits of a modern data scientist.

**Modern patterns of concurrent and parallel programming** Packt Publishing Ltd

Summary Concurrency in .NET teaches you how to build concurrent and scalable programs in .NET using the functional paradigm. This intermediate-level guide is aimed at developers, architects, and passionate computer programmers who are interested in writing code with improved speed and effectiveness by adopting a declarative and pain-free programming style. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Unlock the incredible performance built into your multi-processor machines. Concurrent applications run faster because they spread work across processor cores, performing several tasks at the same time. Modern tools and techniques on the .NET platform, including parallel LINQ, functional programming, asynchronous programming, and the Task Parallel Library, offer powerful alternatives to traditional thread-based concurrency. About the Book Concurrency in .NET teaches you to write code that delivers the speed you need for performance-sensitive applications. Featuring examples in both C# and F#, this book guides you through concurrent and parallel designs that emphasize functional programming in theory and practice. You'll start with the foundations of concurrency and master essential techniques and design practices to optimize code running on modern multiprocessor systems. What's Inside The most important concurrency abstractions Employing the agent programming model Implementing real-time event-stream processing Executing unbounded asynchronous operations Best concurrent practices and patterns that apply to all platforms About the Reader For readers skilled with C# or F#. About the Book Riccardo Terrell is a seasoned software engineer and Microsoft MVP who is passionate about functional programming. He has over 20 years' experience delivering cost-effective technology solutions in a competitive business environment. Table of Contents PART 1 - Benefits of functional programming applicable to concurrent programs Functional concurrency foundations Functional programming techniques for concurrency Functional data structures and immutability PART 2 - How to approach the different parts of a concurrent program The basics of processing big data: data parallelism, part 1 PLINQ and MapReduce: data parallelism, part 2 Real-time event streams: functional reactive programming Task-based functional parallelism Task asynchronicity for the win Asynchronous functional programming in F# Functional combinators for fluent concurrent programming Applying reactive programming everywhere with agents Parallel workflow and agent programming with TPL Dataflow PART 3 - Modern patterns of concurrent programming applied Recipes and design patterns for successful concurrent programming Building a scalable mobile app with concurrent functional programming

**The Future of Computing Performance** Foundations of Multithreaded, Parallel, and Distributed Programming

Providing an overview of the Solaris and POSIX multithreading architectures, this book explains threads at a level that is completely accessible to programmers and system architects with no previous knowledge of threads. It covers the business and technical benefits of threaded programs, along with discussions of third party software that is threaded, pointing out the benefits. It also describes the design of the Solaris MT API, with references to distinctions in POSIX, contains a set of example programs which illustrate the usage of the Solaris and POSIX APIs, and explains the use of programming tools: Thread Analyzer, LockLint, LoopTool and Debugger.

[Programming Multicore and Many-core Computing Systems](#) National Academies Press

An introduction to the engineering principles of embedded systems, with a focus on modeling, design, and analysis of cyber-physical systems. The most visible use of computers and software is processing information for human consumption. The vast majority of computers in use, however, are much less visible. They run the engine, brakes, seatbelts, airbag, and audio system in your car. They digitally encode your voice and construct a radio signal to send it from your cell phone to a base station. They command robots on a factory floor, power generation in a power plant, processes in a chemical plant, and traffic lights in a city. These less visible computers are called embedded systems, and the software they run is called embedded software. The principal challenges in designing and analyzing embedded systems stem from their interaction with physical processes. This book takes a cyber-physical approach to embedded systems, introducing the engineering concepts underlying embedded systems as a technology and as a subject of study. The focus is on modeling, design, and analysis of cyber-physical systems, which integrate computation, networking, and physical processes. The second edition offers two new chapters, several new exercises, and other improvements. The book can be used as a textbook at the advanced undergraduate or introductory graduate level and as a professional reference for practicing engineers and computer scientists. Readers should have some familiarity with machine structures, computer programming, basic discrete mathematics and algorithms, and signals and systems.

[Parallel Metaheuristics](#) Cambridge University Press

Mastering Cloud Computing is designed for undergraduate students learning to develop cloud computing applications. Tomorrow's applications won't live on a single computer but will be deployed from and reside on a virtual server, accessible anywhere, any time. Tomorrow's application developers need to understand the requirements of building apps for these virtual systems, including concurrent programming, high-performance computing, and data-intensive systems. The book introduces the principles of distributed and parallel computing underlying cloud architectures and specifically focuses on virtualization, thread programming, task programming, and map-reduce programming. There are examples demonstrating all of these and more, with exercises and labs throughout. Explains how to make design choices and tradeoffs to consider when building applications to run in a virtual cloud environment Real-world case studies include scientific, business, and energy-efficiency considerations

[A Cyber-Physical Systems Approach](#) Addison-Wesley Professional

Essential reading to understand patterns for parallel programming Software patterns have revolutionized the way we think about how software is designed, built, and documented, and the design of parallel software requires you to consider other particular design aspects and special skills.

From clusters to supercomputers, success heavily depends on the design skills of software developers. Patterns for Parallel Software Design presents a pattern-oriented software architecture approach to parallel software design. This approach is not a design method in the classic sense, but a new way of managing and exploiting existing design knowledge for designing parallel programs. Moreover, such approaches enhance not only build-time properties of parallel systems, but also, and particularly, their run-time properties. Features known solutions in concurrent and distributed programming, applied to the development of parallel programs Provides architectural patterns that describe how to divide an algorithm and/or data to find a suitable partition and link it with a programming structure that allows for such a division Presents an architectural point of view and explains the development of parallel software Patterns for Parallel Software Design will give you the skills you need to develop parallel software.

[Implementing, Testing, and Debugging Multithreaded Java and C++/Pthreads/Win32 Programs](#)

Walter de Gruyter GmbH & Co KG

Foundations of Multithreaded, Parallel, and Distributed Programming covers, and then applies, the core concepts and techniques needed for an introductory course in this subject. Its emphasis is on the practice and application of parallel systems, using real-world examples throughout. Greg Andrews teaches the fundamental concepts of multithreaded, parallel and distributed computing and relates them to the implementation and performance processes. He presents the appropriate breadth of topics and supports these discussions with an emphasis on performance. Features Emphasizes how to solve problems, with correctness the primary concern and performance an important, but secondary, concern Includes a number of case studies which cover such topics as pthreads, MPI, and OpenMP libraries, as well as programming languages like Java, Ada, high performance Fortran, Linda, Occam, and SR Provides examples using Java syntax and discusses how Java deals with monitors, sockets, and remote method invocation Covers current programming techniques such as semaphores, locks, barriers, monitors, message passing, and remote invocation Concrete examples are executed with complete programs, both shared and distributed Sample applications include scientific computing and distributed systems 0201357526B04062001

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