Concurrent Programming Principles And Practice

Software -- Programming Languages.
Intelligent agents are one of the most important developments in computer scie
the past decade. Agents are of interest in many important application areas, ran
from human-computer interaction to industrial process control. The ATAL worksl
series aims to bring together researchers interested in the core/micro aspects
technology. Speci?cally, ATAL addresses issues such as theories of agency, softw
architectures for intelligent agents, methodologies and programming languages f
lizing agents, and software tools for applying and evaluating agent systems. One
strengthsoftheATALworkshopseriesisitsemphasisonthesynergiesbetweentheories
languages, architectures, infrastructures, methodologies, and formal methods. Th
year s workshop continued the ATAL trend of attracting a large number of high
submissions. In more detail, 71 papers were submitted to the ATAL 2OOO worksl
from 21 countries. After stringent reviewing, 22 papers were accepted for publi
and appear in these proceedings. As with previous workshops in the series, we
emphasize what we perceive asimportantnewthemesinagentresearch. Thisyear

sthemeswerebothassociatedwith the fact that the technology of intelligent age
multi-agent systems is beginning to migrate from research labs to software eng
centers. As agents are deployed in applications such as electronic commerce, an
to take over responsibilities for their human users, techniques for controlling th
autonomy become crucial. As well, the availability of tools that facilitate the des
implementation of agent systems becomes an important factor in how rapidly th
technology will achieve widespread use.

Threads are a fundamental part of the Java platform. As multicore processors be
the norm, using concurrency effectively becomes essential for building high-
performance applications. Java SE 5 and 6 are a huge step forward for the
development of concurrent applications, with improvements to the Java Virtual
Machine to support high-performance, highly scalable concurrent classes and a
set of new concurrency building blocks. In Java Concurrency in Practice , the cre
of these new facilities explain not only how they work and how to use them, bu
the motivation and design patterns behind them. However, developing, testing, a
debugging multithreaded programs can still be very difficult; it is all too easy to
concurrent programs that appear to work, but fail when it matters most: in pro
under heavy load. Java Concurrency in Practice arms readers with both the thec
underpinnings and concrete techniques for building reliable, scalable, maintainable

concurrent applications. Rather than simply offering an inventory of concurrency and mechanisms, it provides design rules, patterns, and mental models that make easier to build concurrent programs that are both correct and performant. This covers: Basic concepts of concurrency and thread safety Techniques for building composing thread-safe classes Using the concurrency building blocks in java.util.concurrent Performance optimization dos and don'ts Testing concurrent programs Advanced topics such as atomic variables, nonblocking algorithms, and Java Memory Model

This collection of papers arose from a series of lectures for workers in compute science and other disciplines. The lectures were intended to familiarize them with of the most exciting advanced computer based systems for the conceptualization design, implementation, simulation, and logical analysis of applications in these disciplines. The collection presents some strong motivational points for the use theory based systems in the areas of functional programming, concurrency, simu and automated reasoning, highlighting some of their advantages and disadvantag relative to conventional systems. The papers are mostly the work of individuals were among the originators of the systemspresented. The volume is intended as contribution to narrowing the learning gap facing conventional computer users they wish to use advanced theory based systems. The papers are meant for a w

audience and should not require great mathematical sophistication for their comprehension. The papers contain numerous references for those wishing to pu topic in greater depth.

Concurrent Programming in Java

Object-Based Concurrent Computing

International Lecture Series 1991-1992, McMaster University, Hamilton, Ontario, Canada

Advanced Topics in Exception Handling Techniques

International Conference PPDP ... Proceedings

Reliable Software Technologies - Ada-Europe 2008

This volume constitutes the refereed proceedings of the 9th International Symposium on Programming Languages, Implementations, Logics and Programs, PLILP '97, held in Southampton, UK, in September 1997, including a special track on Declarative Programming in Education. The volume presents 25 revised full papers selected from 68 submissions. Also included are one invited paper and three posters. The papers are devoted to exploring the relation between implementation techniques, the logic of the languages, and the use of the languages in construcing real programs. Topics of interest include implementation of declarative concepts, integration of paradigms, program analysis and transformation, programming environments, executable specifications, reasoning about language constructs, etc.

Scalable parallel systems or, more generally, distributed memory systems offer a challenging model of computing and pose fascinating problems regarding compiler optimization, ranging from language design to run time systems. Research in this area is foundational to many challenges from memory hierarchy optimizations to communication optimization. This unique, handbook-like monograph assesses the state of the art in the area in a systematic and comprehensive way. The 21 coherent chapters by leading researchers provide complete and competent coverage of all relevant aspects of compiler optimization for scalable parallel systems. The book is divided into five parts on languages, analysis, communication optimizations, code generation, and run time systems. This book will serve as a landmark source for education, information, and reference to students, practitioners, professionals, and researchers interested in updating their knowledge about or active in parallel computing.

Foreword by Bjarne Stroustrup Software is generally acknowledged to be the single greatest obstacle preventing mainstream adoption of massively-parallel computing. While sequential applications are routinely ported to platforms ranging from PCs to mainframes, most parallel programs only ever run on one type of machine. One reason for this is that most parallel programming systems have failed to insulate their users from the architectures of the machines on which they have run. Those that have been platform-independent have usually also had poor performance. Many researchers now believe that object-oriented languages may offer a solution. By hiding the architecture-specific constructs required for high performance inside platform-independent abstractions, parallel object-oriented programming systems may be able to combine the speed of massively-parallel computing

with the comfort of sequential programming. Parallel Programming Using C++ describes fifteen parallel programming systems based on C++, the most popular object-oriented language of today. These systems cover the whole spectrum of parallel programming paradigms, from data parallelism through dataflow and distributed shared memory to message-passing control parallelism. For the parallel programming community, a common parallel application is discussed in each chapter, as part of the description of the system itself. By comparing the implementations of the polygon overlay problem in each system, the reader can get a better sense of their expressiveness and functionality for a common problem. For the systems community, the chapters contain a discussion of the implementation of the various compilers and runtime systems. In addition to discussing the performance of polygon overlay, several of the contributors also discuss the performance of other, more substantial, applications. For the research community, the contributors discuss the motivations for and philosophy of their systems. As well, many of the chapters include critiques that complete the research arc by pointing out possible future research directions. Finally, for the object-oriented community, there are many examples of how encapsulation, inheritance, and polymorphism can be used to control the complexity of developing, debugging, and tuning parallel software.

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

On Concurrent Programming

Computer Aided Verification

Concurrent Programming on Windows

CONCUR 2014 – Concurrency Theory

9th International Symposium, PLILP '97, Including a Special Track on Declarative Programming Languages in Education, Southampton, UK, September 3-5, 1997. Proceedings

Teaching the science and the technology of programming as a unified discipline that shows the deep relationships between programming paradigms. This innovative text presents computer programming as a unified discipline in a way

that is both practical and scientifically sound. The book focuses on techniques of lasting value and explains them precisely in terms of a simple abstract machine. The book presents all major programming paradigms in a uniform framework that shows their deep relationships and how and where to use them together. After an introduction to programming concepts, the book presents both well-known and lesser-known computation models ("programming paradigms"). Each model has its own set of techniques and each is included on the basis of its usefulness in practice. The general models include declarative programming, declarative concurrency, message-passing concurrency, explicit state, object-oriented programming, shared-state concurrency, and relational programming. Specialized models include graphical user interface programming, distributed programming, and constraint programming. Each model is based on its kernel language—a simple core language that consists of a small number of programmer-significant elements. The kernel languages are introduced progressively, adding concepts one by one, thus showing the deep relationships between different models. The kernel languages are defined precisely in terms of a simple abstract machine. Because a wide variety of languages and programming paradigms can be modeled by a small set of closely related kernel languages, this approach allows programmer and student to grasp the

underlying unity of programming. The book has many program fragments and exercises, all of which can be run on the Mozart Programming System, an Open Source software package that features an interactive incremental development environment.

Master the essentials of concurrent programming,including testingand debugging This textbook examines languages and libraries for multithreadedprogramming. Readers learn how to create threads in Java and C++,and develop essential concurrent programming and problem-solvingskills. Moreover, the textbook sets itself apart from othercomparable works by helping readers to become proficient in keytesting and debugging techniques. Among the topics covered, readersare introduced to the relevant aspects of Java, the POSIX Pthreadslibrary, and the Windows Win32 Applications ProgrammingInterface. The authors have developed and fine-tuned this book through theconcurrent programming courses they have taught for the past twentyyears. The material, which emphasizes practical tools andtechniques to solve concurrent programming problems, includesoriginal results from the authors' research. Chaptersinclude: * Introduction to concurrent programming * The critical section problem * Semaphores and locks * Monitors * Message-passing * Message-passing in distributed programs * Testing and debugging

concurrent programs As an aid to both students and instructors, class libraries havebeen implemented to provide working examples of all the materialthat is covered. These libraries and the testing techniques theysupport can be used to assess student-written programs. Each chapter includes exercises that build skills in programwriting and help ensure that readers have mastered the chapter'skey concepts. The source code for all the listings in the text andfor the synchronization libraries is also provided, as well asstartup files and test cases for the exercises. This textbook is designed for upper-level undergraduates andgraduate students in computer science. With its abundance ofpractical material and inclusion of working code, coupled with anemphasis on testing and debugging, it is also a highly usefulreference for practicing programmers. This book constitutes the refereed proceedings of the 25th International Symposium on Distributed Computing, DISC 2011, held in Rome, Italy, in September 2011. The 31 revised full papers presented together with invited lectures and brief announcements were carefully reviewed and selected from 136 submissions. The papers are organized in topical sections on distributed graph algorithms; shared memory; brief announcements; fault-tolerance and security; paxos plus; wireless; network algorithms; aspects of locality; consensus; concurrency.

Several aspects of informatics curricula and teaching methods at the university level are reported in this volume, including: *Challenges in defining an international curriculum; *The diversity in informatics curricula; *Computing programs for scientists and engineers; *Patterns of curriculum design; *Student interaction; *Teaching of programming; *Peer review in education. This book contains a selection of the papers presented at the Working Conference on Informatics Curricula, Teaching Methods and Best Practice (ICTEM 2002), which was sponsored by the International Federation for Information Processing (IFIP) Working Group 3.2, and held in Florianópolis, Brazil in July 2002. The working groups were organized in three parallel tracks. Working Group 1 discussed the "Directions and Challenges in Informatics Education". The focus of Working Group 2 was "Teaching Programming and Problem Solving". Working Group 3 discussed "Computing: The Shape of an Evolving Discipline."
Java Concurrency in Practice
25th International Symposium, DISC 2011, Rome, Italy, September 20-22, 2011, Proceedings
IFIP TC3 / WG3.2 Conference on Informatics Curricula, Teaching Methods and Best Practice (ICTEM 2002) July 10–12, 2002, Florianópolis, SC, Brazil
The JR Programming Language

Patterns for Parallel Software Design

Intelligent Agents VII. Agent Theories Architectures and Languages

Accompanying CD-ROM contains ... "advanced/optional content, hundreds of working examples, an active search facility, and live links to manuals, tutorials, compilers, and interpreters on the World Wide Web."--Page 4 of cover.

This book constitutes the refereed proceedings of the International Conference on Principles and Practice of Declarative Programming, PPDP'99, held in Paris, France, in September/October 1999. The 22 revised full papers presented together with three invited contributions were carefully reviewed and selected from a total of 52 full-length papers submitted. Among the topics covered are type theory; logics and logical methods in understanding, defining, integrating, and extending programming paradigms such as functional, logic, object-oriented, constraint, and concurrent programming; support for modularity; the use of logics in the design of program development tools; and development and implementation methods.

The book builds on the student's familiarity with sequential programming in a high level language, and is concerned mainly with

the high level aspects of concurrency.
M->CREATED
The Origin of Concurrent Programming
ECOOP '91 Workshop, Geneva, Switzerland, July 15-16, 1991.
Proceedings
7th International Workshop, ATAL 2000, Boston, MA, USA, July 7-9,
2000. Proceedings
Concepts, Techniques, and Models of Computer Programming
Learning Concurrent Programming in Scala
Concurrent Programming: Algorithms, Principles, and Foundations

"When you begin using multi-threading throughout an application, the importance of clean architecture and design is critical. . . . This places an emphasis on understanding not only the platform's capabilities but also emerging best practices. Joe does a great job interspersing best practices alongside theory throughout his book." – From the Foreword by Craig Mundie, Chief Research and Strategy Officer, Microsoft Corporation Author Joe Duffy has risen to the challenge of explaining how to write software that takes full advantage of concurrency and hardware parallelism. In Concurrent Programming on Windows, he explains how to design, implement, and maintain large-scale concurrent programs, primarily using C# and C++ for Windows. Duffy aims to give application, system, and library developers the tools and techniques needed to write efficient, safe code for multicore processors. This is important not only for the

kinds of problems where concurrency is inherent and easily exploitable—such as server applications, compute-intensive image manipulation, financial analysis, simulations, and AI algorithms—but also for problems that can be speeded up using parallelism but require more effort—such as math libraries, sort routines, report generation, XML manipulation, and stream processing algorithms. Concurrent Programming on Windows has four major sections: The first introduces concurrency at a high level, followed by a section that focuses on the fundamental platform features, inner workings, and API details. Next, there is a section that describes common patterns, best practices, algorithms, and data structures that emerge while writing concurrent software. The final section covers many of the common system-wide architectural and process concerns of concurrent programming. This is the only book you'll need in order to learn the best practices and common patterns for programming with concurrency on Windows and .NET.

Euro-Par – the European Conference on Parallel Computing – is an international conference series dedicated to the promotion and advancement of all aspects of parallel computing. The major themes can be divided into the broad categories of hardware, software, algorithms, and applications for parallel computing. The objective of Euro-Par is to provide a forum within which to promote the dev- opment of parallel computing both as an industrial technique and an academic discipline, extending the frontier of both the state of the art and the state of the practice. This is particularlyimportant at a time when parallel computing is - dergoing strong and sustained development and experiencing real industrial take up. The main audience for and

participants of Euro-Par are seen as researchers in academic departments, government laboratories, and industrial organisations. Euro-Par's objective is to become the primarychoice of such professionals for the presentation of new results in their speci?c areas. Euro-Par is also interested in applications that demonstrate the e?ectiveness of the main Euro-Par themes. Euro-Par now has its own Internet domain with a permanent Web site where the historyof the conference series is described: http://www. euro-par. org. The Euro-Par conference series is sponsored bythe Association of Computer Machineryand the International Federation of Information Processing.

Mathematics of Computing -- Parallelism.

This book constitutes the strictly refereed proceedings of the 9th International Conference on Computer Aided Verification, CAV '97, held in Haifa, Israel, in June 1997. The volume presents 34 revised full papers selected from a total of 84 submissions. Also included are 7 invited contributions as well as 12 tool descriptions. The volume is dedicated to the theory and practice of computer aided formal methods for software and hardware verification, with an emphasis on verification tools and algorithms and the techniques needed for their implementation. The book is a unique record documenting the recent progress in the area.

Concurrent Programming Using μC++

Parallel Programming Using C++

Principles of Concurrent and Distributed Programming

Languages, Compilation Techniques, and Run Time Systems

Concurrent Patterns and Best Practices

Design Principles and Patterns

An essential reader containing 19 important papers on the invention and early development of concurrent programming and its relevance to computer science and computer engineering. All of them are written by the pioneers in concurrent programming, including Brinch Hansen himself, and have introductions added that summarize the papers and put them in perspective. The editor provides an overview chapter and neatly places all developments in perspective with chapter introductions and expository apparatus. Essential resource for graduates, professionals, and researchers in CS with an interest in concurrent programming principles. A familiarity with operating system principles is assumed.

Here, one of the leading figures in the field provides a comprehensive survey of the subject, beginning with prepositional logic and concluding with concurrent programming. It is based on graduate courses taught at Cornell University and is designed for use as a graduate text. Professor Schneier emphasises the use of formal methods and assertional reasoning using notation and paradigms drawn from programming to drive the exposition, while exercises at the end of each chapter extend and illustrate the main themes covered. As a result, all those interested in studying concurrent computing will find this an invaluable approach to the subject.

This book is devoted to the most difficult part of concurrent programming, namely synchronization concepts, techniques and principles when the cooperating entities are asynchronous, communicate through a shared memory, and may experience failures. Synchronization is no longer a set of tricks but, due to research results in recent decades, it relies today on sane scientific foundations as explained in this book. In this book the author explains synchronization and the implementation of concurrent

objects, presenting in a uniform and comprehensive way the major theoretical and practical results of the past 30 years. Among the key features of the book are a new look at lock-based synchronization (mutual exclusion, semaphores, monitors, path expressions); an introduction to the atomicity consistency criterion and its properties and a specific chapter on transactional memory; an introduction to mutex-freedom and associated progress conditions such as obstruction-freedom and wait-freedom; a presentation of Lamport's hierarchy of safe, regular and atomic registers and associated wait-free constructions; a description of numerous wait-free constructions of concurrent objects (queues, stacks, weak counters, snapshot objects, renaming objects, etc.); a presentation of the computability power of concurrent objects including the notions of universal construction, consensus number and the associated Herlihy's hierarchy; and a survey of failure detector-based constructions of consensus objects. The book is suitable for advanced undergraduate students and graduate students in computer science or computer engineering, graduate students in mathematics interested in the foundations of process synchronization, and practitioners and engineers who need to produce correct concurrent software. The reader should have a basic knowledge of algorithms and operating systems.

Summary This bestseller has been updated and revised to cover all the latest changes to C++ 14 and 17! C++ Concurrency in Action, Second Edition teaches you everything you need to write robust and elegant multithreaded applications in C++17. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology You choose C++ when your applications need to run fast. Well-designed concurrency makes them go even faster. C++ 17 delivers strong support for the multithreaded, multiprocessor programming required for fast graphic processing, machine learning, and other performance-sensitive tasks. This exceptional book unpacks the features, patterns, and best practices of production-grade C++ concurrency. About the Book C++

Concurrency in Action, Second Edition is the definitive guide to writing elegant multithreaded applications in C++. Updated for C++ 17, it carefully addresses every aspect of concurrent development, from starting new threads to designing fully functional multithreaded algorithms and data structures. Concurrency master Anthony Williams presents examples and practical tasks in every chapter, including insights that will delight even the most experienced developer. What's inside Full coverage of new C++ 17 features Starting and managing threads Synchronizing concurrent operations Designing concurrent code Debugging multithreaded applications About the Reader Written for intermediate C and C++ developers. No prior experience with concurrency required. About the Author Anthony Williams has been an active member of the BSI C++ Panel since 2001 and is the developer of the just::thread Pro extensions to the C++ 11 thread library. Table of Contents Hello, world of concurrency in C++! Managing threads Sharing data between threads Synchronizing concurrent operations The C++ memory model and operations on atomic types Designing lock-based concurrent data structures Designing lock-free concurrent data structures Designing concurrent code Advanced thread management Parallel algorithms Testing and debugging multithreaded applications

Concurrent Programming in an Extended Java

Modern Multithreading

9th International Conference, CAV'97, Haifa, Israel, June 22-25, 1997, Proceedings

Operating Systems: Principles And Design

Principles and Practice

Informatics Curricula and Teaching Methods

This book constitutes the refereed proceedings of the 25th International Conference on Concurrency Theory, CONCUR 2014, held in Rome, Italy in

September 2014. The 35 revised full papers presented together with 5 invited talks were carefully reviewed and selected from 124 submissions. The focus of the conference is on the following topics: process calculi, model checking and abstraction, synthesis, quantitative models, automata and multithreading, complexity, process calculi and types, categories, graphs and quantum systems, automata and time, and games.

Principles of Concurrent and Distributed Programming provides an introduction to concurrent programming focusing on general principles and not on specific systems. Software today is inherently concurrent or distributed – from event-based GUI designs to operating and real-time systems to Internet applications. The new edition of this classic introduction to concurrency has been completely revised in view of the growing importance of concurrency constructs embedded in programming languages and of formal methods such as model checking that are widely used in industry.

This book is a must-have tutorial for software developers aiming to write concurrent programs in Scala, or broaden their existing knowledge of concurrency. This book is intended for Scala programmers that have no prior knowledge about concurrent programming, as well as those seeking to broaden their existing knowledge about concurrency. Basic knowledge of the

Scala programming language will be helpful. Readers with a solid knowledge in another programming language, such as Java, should find this book easily accessible.

Concurrent ProgrammingPrinciples and PracticeAddison-Wesley
Compiler Optimizations for Scalable Parallel Systems
Principles and Practice of Declarative Programming
13th Ada-Europe International Conference on Reliable Software
Technologies, Venice, Italy, June 16-20, 2008. Proceedings
CoLogNET/FME Symposium, TFM 2004, Ghent, Belgium, November 18-19,
2004. Proceedings
Static Analysis

The ECOOP '91 Workshop on Object-Based Concurrent Computing was organized toprovide a forum on concurrent, distributed and open-ended computing. The emphasis was on conceptual, theoretical and formal aspects, as well as practical aspects and sound experience, since such a viewpoint was deemed indispensible to investigate and establish a basis for future development. This volume contains 12 papers selected from 25 presented at the workshop, together with a paper by J.A. Goguen, who was an invited speaker at the workshop. The papers are classified into four categories: Formal methods (1):

three papers are concerned with the formal semantics of concurrent objects based on process calculi. Formal methods (2): four papers are concerned with various formal approaches to the semantics of concurrent programs. Concurrent programming: three papers. Models: three papers areconcerned with models for concurrent systems.

A definitive guide to mastering and implementing concurrency patterns in your applications Key FeaturesBuild scalable apps with patterns in multithreading, synchronization, and functional programmingExplore the parallel programming and multithreading techniques to make the code run fasterEfficiently use the techniques outlined to build reliable applicationsBook Description Selecting the correct concurrency architecture has a significant impact on the design and performance of your applications. This book explains how to leverage the different characteristics of parallel architecture to make your code faster and more efficient. To start with, you'll understand the basic concurrency concepts and explore patterns around explicit locking, lock free programming, futures & actors. Then, you'll get insights into different concurrency models and parallel algorithms and put them to practice in different scenarios to realize your application's true potential. We'll take you through multithreading design patterns, such as master, slave, leader, follower, map-reduce, and monitor, also helping you to learn hands-

on coding using these patterns. Once you've grasped all of this, you'll move on to solving problems using synchronizer patterns. You'll discover the rationale for these patterns in distributed & parallel applications, followed by studying how future composition, immutability and the monadic flow help create more robust code. Toward the end of the book, you'll learn about the actor paradigm and actor patterns - the message passing concurrency paradigm. What you will learnExplore parallel architecture Get acquainted with concurrency models Internalize design themes by implementing multithreading patterns Get insights into concurrent design patterns Discover design principles behind many java threading abstractions Work with functional concurrency patternsWho this book is for This is a must-have guide for developers who want to learn patterns to build scalable and high-performing apps. It's assumed that you already have a decent level of programming knowledge.

Multicore microprocessors are now at the heart of nearly all desktop and laptop computers. While these chips offer exciting opportunities for the creation of newer and faster applications, they also challenge students and educators. How can the new generation of computer scientists growing up with multicore chips learn to program applications that exploit this latent processing power? This unique book is an attempt to introduce concurrent programming to first-year computer science

students, much earlier than most competing products. This book assumes no programming background but offers a broad coverage of Java. It includes over 150 numbered and numerous inline examples as well as more than 300 exercises categorized as "conceptual," "programming," and "experiments." The problem-oriented approach presents a problem, explains supporting concepts, outlines necessary syntax, and finally provides its solution. All programs in the book are available for download and experimentation. A substantial index of at least 5000 entries makes it easy for readers to locate relevant information. In a fast-changing field, this book is continually updated and refined. The 2014 version is the seventh "draft edition" of this volume, and features numerous revisions based on student feedback. A list of errata for this version can be found on the Purdue University Department of Computer Science website.

A thorough and self-contained account. Use either as textbook or as a primary reference work.

Distributed Computing

International Conference, PPDP'99, Paris, France, September, 29 - October 1, 1999, Proceedings

Euro-Par 2000 Parallel Processing

Functional Programming, Concurrency, Simulation and Automated Reasoning

Build scalable apps with patterns in multithreading, synchronization, and functional programming
Start Concurrent
This book – inspired by two ECOOP workshops on exception handling - is composed of five parts; the first four address exception handling and related topics in the context of programming languages, concurrency and operating systems, pervasive computing systems, and requirements and specifications. The last part offers case studies, experimentation and qualitative comparisons. The 16 coherently written chapters by leading researchers review a wide range of issues in exception handling.
JR is an extension of the Java programming language with additional concurrency mechanisms based on those in the SR (Synchronizing Resources) programming language. The JR implementation executes on UNIX-based systems (Linux, Mac OS X, and Solaris) and Windows-based systems. It is available free from the JR webpage. This book describes the JR programming language and illustrates how it can be used to write concurrent programs for a variety of applications. This text presents numerous small and large example programs. The source code for all programming examples and the given parts of all programming exercises are available on the JR webpage. Dr. Ronald A. Olsson and Dr. Aaron W. Keen, the authors of this text, are the designers and implementors of JR.

This book constitutes the refereed proceedings of the CoLogNet/FME Symposium on Teaching Formal Methods, TFM 2004, held in Ghent, Belgium in November 2004. The 15 revised full papers presented together with an invited paper and 2 abstracts of invited talks were carefully reviewed and selected from numerous submissions. The papers presented explore the failures and successes of formal methods education, consider how the failures might be resolved, evaluate how to learn from the successes, and attempt promoting cooperative projects to further the teaching and learning and the usage and acceptance of formal methods.

This book constitutes the refereed proceedings of the 13th International Conference on Reliable Software Technologies, Ada-Europe 2008, held in Venice, Italy, in June 2008. The 20 revised full papers presented were carefully reviewed and selected from numerous submissions. The conference proceedings published in this volume cover topics ranging from formal verification to real-time systems via concurrency, embedded systems, language technologies, model-driven engineering and applications of Petri Nets.

Concurrent Programming

6th International Euro-Par Conference Munich, Germany, August 29 – September 1, 2000 Proceedings

From Semaphores to Remote Procedure Calls

Programming Languages: Implementations, Logics, and Programs

Teaching Formal Methods

Understanding Control Flow

The control-flow issues presented in this textbook are extremely relevant in modern computer languages and programming styles. In addition to the basic control-flow mechanisms, virtually all new computer languages provide some form of exceptional control flow to support robust programming introduced in this textbook. Also, concurrency capabilities are appearing with increasing frequency in both new and old programming languages, and are covered in this book. Understanding Control Flow: With Concurrent Programming Using µC++ starts with looping, and works through each of the basic control-flow concepts, examining why each is fundamental and where it is useful. Time is spent on each concept according to its level of difficulty. Examples and exercises are also provided in this textbook. New programming methodologies are requiring new forms of control flow, and new programming languages are supporting these methodologies with new control structures, such as the concurrency constructs discussed in this textbook. Most computers now contain multi-threading and multi-cores, while multiple processors and distributed systems are ubiquitous — all of which require advanced programming methodologies to take full advantage of the available parallelism summarized in this textbook.

Advance forms of control flow are becoming basic programming skills needed by all programmers, not just graduate students working in the operating systems or database disciplines. This textbook is designed for advanced-level students studying computer science and engineering. Professionals and researchers working in this field, specifically programming and software engineering, will find this book useful as a reference.
This book constitutes the thoroughly refereed proceedings of the 20th International Symposium on Static Analysis, SAS 2013, held in Seattle, WA, USA, in June 2013. The 23 revised full papers presented together with 2 invited talks were selected from 56 submissions. The papers address all aspects of static analysis, including abstract domains, abstract interpretation, abstract testing, bug detection, data flow analysis, model checking, new applications, program transformation, program verification, security analysis, theoretical frameworks, and type checking.
Programming Language Pragmatics
20th International Symposium, SAS 2013, Seattle, WA, USA, June 20-22, 2012, Proceedings
An Introduction to Problem Solving in Java with a Focus on Concurrency, 2014
25th International Conference, CONCUR 2014, Rome, Italy, September

**2-5, 2014. Proceedings
Concurrency in Ada
C++ Concurrency in Action**