

Synchronization Algorithms And Concurrent Programming

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CONCURRENT PROGRAMMING: ALGORITHMS, PRINCIPLES, AND FOUNDATIONS - MICHEL RAYNAL 2012-12-30

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 SAME 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.

CONCURRENT PROGRAMMING ON WINDOWS - JOE DUFFY 2008-10-28

“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.

DISTRIBUTED COMPUTING - IDIT KEIDAR 2009-09-07

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 23RD INTERNATIONAL SYMPOSIUM ON DISTRIBUTED COMPUTING, DISC 2009, HELD IN ELCHE, SPAIN, IN SEPTEMBER 2009. THE 33 REVISED FULL PAPERS, SELECTED FROM 121 SUBMISSIONS, ARE PRESENTED TOGETHER WITH 15 BRIEF ANNOUNCEMENTS OF ONGOING WORKS; ALL OF THEM WERE CAREFULLY REVIEWED AND SELECTED FOR INCLUSION IN THE BOOK. THE PAPERS ADDRESS ALL ASPECTS OF DISTRIBUTED COMPUTING, AND WERE ORGANIZED IN TOPICAL SECTIONS ON MICHEL RAYNAL AND SHMUEL ZAKS 60TH BIRTHDAY SYMPOSIUM, AWARD NOMINEES, TRANSACTIONAL MEMORY, SHARED MEMORY, DISTRIBUTED AND LOCAL GRAPH ALGORITHMS, MODELING ISSUES, GAME THEORY, FAILURE DETECTORS, FROM THEORY TO PRACTICE, GRAPH ALGORITHMS AND ROUTING, CONSENSUS AND BYZANTINE AGREEMENT AND RADIO NETWORKS.

DISTRIBUTED COMPUTING AND NETWORKING - MARCOS K. AGUILERA 2011-01-10

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 12TH INTERNATIONAL CONFERENCE ON DISTRIBUTED COMPUTING AND NETWORKING, ICDCN 2011, HELD IN BANGALORE, INDIA, DURING JANUARY 2-5, 2011. THE 31 REVISED FULL PAPERS AND 3 REVISED SHORT PAPERS PRESENTED TOGETHER WITH 3 INVITED LECTURES WERE CAREFULLY REVIEWED AND SELECTED FROM 140 SUBMISSIONS. THE PAPERS ADDRESS ALL CURRENT ISSUES IN THE FIELD OF DISTRIBUTED COMPUTING AND NETWORKING. BEING A LEADING FORUM FOR RESEARCHERS AND PRACTITIONERS TO EXCHANGE IDEAS AND SHARE BEST PRACTICES, ICDCN ALSO SERVES AS A FORUM FOR PHD STUDENTS TO SHARE THEIR RESEARCH IDEAS AND GET QUALITY FEEDBACK FROM THE WELL-RENOUNDED EXPERTS IN THE FIELD.

THE ART OF MULTIPROCESSOR PROGRAMMING, REVISED REPRINT - MAURICE HERLIHY 2012-06-25

REVISED AND UPDATED WITH IMPROVEMENTS CONCEIVED IN PARALLEL PROGRAMMING COURSES, THE ART OF MULTIPROCESSOR PROGRAMMING IS AN AUTHORITATIVE GUIDE TO MULTICORE PROGRAMMING. IT INTRODUCES A HIGHER LEVEL SET OF SOFTWARE DEVELOPMENT SKILLS THAN THAT NEEDED FOR EFFICIENT SINGLE-CORE PROGRAMMING. THIS BOOK PROVIDES COMPREHENSIVE COVERAGE OF THE NEW PRINCIPLES, ALGORITHMS, AND TOOLS NECESSARY FOR EFFECTIVE MULTIPROCESSOR PROGRAMMING. STUDENTS AND PROFESSIONALS ALIKE WILL BENEFIT FROM THOROUGH COVERAGE OF KEY MULTIPROCESSOR PROGRAMMING ISSUES. THIS REVISED EDITION INCORPORATES MUCH-DEMANDED UPDATES THROUGHOUT THE BOOK, BASED ON FEEDBACK AND CORRECTIONS REPORTED FROM CLASSROOMS SINCE 2008 LEARN THE FUNDAMENTALS OF PROGRAMMING MULTIPLE THREADS ACCESSING SHARED MEMORY EXPLORE MAINSTREAM CONCURRENT DATA STRUCTURES AND THE KEY ELEMENTS OF THEIR DESIGN, AS WELL AS SYNCHRONIZATION TECHNIQUES FROM SIMPLE LOCKS TO TRANSACTIONAL MEMORY SYSTEMS VISIT THE COMPANION SITE AND DOWNLOAD SOURCE CODE, EXAMPLE JAVA PROGRAMS, AND MATERIALS TO SUPPORT AND ENHANCE THE LEARNING EXPERIENCE

ENCYCLOPEDIA OF PARALLEL COMPUTING - DAVID PADUA 2011-09-08

CONTAINING OVER 300 ENTRIES IN AN A-Z FORMAT, THE ENCYCLOPEDIA OF PARALLEL COMPUTING PROVIDES EASY, INTUITIVE ACCESS TO RELEVANT INFORMATION FOR PROFESSIONALS AND RESEARCHERS SEEKING ACCESS TO ANY ASPECT WITHIN THE BROAD FIELD OF PARALLEL COMPUTING. TOPICS FOR THIS COMPREHENSIVE REFERENCE WERE SELECTED, WRITTEN, AND PEER-REVIEWED BY AN INTERNATIONAL POOL OF DISTINGUISHED RESEARCHERS IN THE FIELD. THE ENCYCLOPEDIA IS BROAD IN SCOPE, COVERING MACHINE ORGANIZATION, PROGRAMMING LANGUAGES, ALGORITHMS, AND APPLICATIONS. WITHIN EACH AREA, CONCEPTS, DESIGNS, AND SPECIFIC IMPLEMENTATIONS ARE PRESENTED. THE HIGHLY-STRUCTURED ESSAYS IN THIS WORK COMPRISE SYNONYMS, A DEFINITION AND DISCUSSION OF THE TOPIC, BIBLIOGRAPHIES, AND LINKS TO RELATED LITERATURE. EXTENSIVE CROSS-REFERENCES TO OTHER ENTRIES WITHIN THE ENCYCLOPEDIA SUPPORT EFFICIENT, USER-FRIENDLY SEARCHERS FOR IMMEDIATE ACCESS TO USEFUL INFORMATION. KEY CONCEPTS PRESENTED IN THE ENCYCLOPEDIA OF PARALLEL COMPUTING INCLUDE; LAWS AND METRICS; SPECIFIC NUMERICAL AND NON-NUMERICAL ALGORITHMS; ASYNCHRONOUS ALGORITHMS; LIBRARIES OF SUBROUTINES; BENCHMARK SUITES; APPLICATIONS; SEQUENTIAL CONSISTENCY AND CACHE COHERENCY; MACHINE CLASSES SUCH AS CLUSTERS, SHARED-MEMORY MULTIPROCESSORS, SPECIAL-PURPOSE MACHINES AND DATAFLOW MACHINES; SPECIFIC MACHINES SUCH AS CRAY SUPERCOMPUTERS, IBM'S CELL PROCESSOR AND INTEL'S MULTICORE MACHINES; RACE DETECTION AND AUTO PARALLELIZATION; PARALLEL PROGRAMMING LANGUAGES, SYNCHRONIZATION PRIMITIVES, COLLECTIVE OPERATIONS, MESSAGE PASSING LIBRARIES, CHECKPOINTING, AND OPERATING SYSTEMS. TOPICS COVERED: SPEEDUP, EFFICIENCY, ISOEFFICIENCY, REDUNDANCY, AMDAHL'S LAW, COMPUTER ARCHITECTURE CONCEPTS, PARALLEL MACHINE DESIGNS, BENCHMARKS, PARALLEL PROGRAMMING CONCEPTS & DESIGN, ALGORITHMS, PARALLEL APPLICATIONS. THIS AUTHORITATIVE REFERENCE WILL BE PUBLISHED IN TWO FORMATS: PRINT AND ONLINE. THE ONLINE EDITION FEATURES HYPERLINKS TO CROSS-REFERENCES AND TO ADDITIONAL SIGNIFICANT RESEARCH. RELATED SUBJECTS: SUPERCOMPUTING, HIGH-PERFORMANCE COMPUTING, DISTRIBUTED COMPUTING

Pro TBB - MICHAEL VOSS 2019-07-09

THIS OPEN ACCESS BOOK IS A MODERN GUIDE FOR ALL C++ PROGRAMMERS TO LEARN THREADING BUILDING BLOCKS (TBB). WRITTEN BY TBB AND PARALLEL PROGRAMMING EXPERTS, THIS BOOK REFLECTS THEIR COLLECTIVE DECADES OF EXPERIENCE IN DEVELOPING AND TEACHING PARALLEL PROGRAMMING WITH TBB, OFFERING THEIR INSIGHTS IN AN APPROACHABLE MANNER. THROUGHOUT THE BOOK THE AUTHORS PRESENT NUMEROUS EXAMPLES AND BEST PRACTICES TO HELP YOU BECOME AN EFFECTIVE TBB PROGRAMMER AND LEVERAGE THE POWER OF PARALLEL SYSTEMS. Pro TBB STARTS WITH THE BASICS, EXPLAINING PARALLEL ALGORITHMS AND C++'S BUILT-IN STANDARD TEMPLATE LIBRARY FOR PARALLELISM. YOU'LL LEARN THE KEY CONCEPTS OF MANAGING MEMORY, WORKING WITH DATA STRUCTURES AND HOW TO HANDLE TYPICAL ISSUES WITH SYNCHRONIZATION. LATER CHAPTERS APPLY THESE IDEAS TO COMPLEX SYSTEMS TO EXPLAIN PERFORMANCE TRADEOFFS,

MAPPING COMMON PARALLEL PATTERNS, CONTROLLING THREADS AND OVERHEAD, AND EXTENDING TBB TO PROGRAM HETEROGENEOUS SYSTEMS OR SYSTEM-ON-CHIPS. WHAT YOU'LL LEARN USE THREADING BUILDING BLOCKS TO PRODUCE CODE THAT IS PORTABLE, SIMPLE, SCALABLE, AND MORE UNDERSTANDABLE REVIEW BEST PRACTICES FOR PARALLELIZING COMPUTATIONALLY INTENSIVE TASKS IN YOUR APPLICATIONS INTEGRATE TBB WITH OTHER THREADING PACKAGES CREATE SCALABLE, HIGH PERFORMANCE DATA-PARALLEL PROGRAMS WORK WITH GENERIC PROGRAMMING TO WRITE EFFICIENT ALGORITHMS WHO THIS BOOK IS FOR C++ PROGRAMMERS LEARNING TO RUN APPLICATIONS ON MULTICORE SYSTEMS, AS WELL AS C OR C++ PROGRAMMERS WITHOUT MUCH EXPERIENCE WITH TEMPLATES. NO PREVIOUS EXPERIENCE WITH PARALLEL PROGRAMMING OR MULTICORE PROCESSORS IS REQUIRED.

FORMAL METHODS FOR INDUSTRIAL CRITICAL SYSTEMS - STEFAN KOWALEWSKI
2010-09-09

THIS BOOK CONSTITUTES THE PROCEEDINGS OF THE 15TH INTERNATIONAL WORKSHOP ON FORMAL METHODS FOR INDUSTRIAL CRITICAL SYSTEMS, FMICS 2010 HELD IN ANTWERP, BELGIUM, IN SEPTEMBER 2010 - CO-LOCATED WITH ASE 2010, THE 25TH IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING, THE 14 PAPERS PRESENTED WERE CAREFULLY REVIEWED AND SELECTED FROM 33 SUBMISSIONS. THE AIM OF THE FMICS WORKSHOP SERIES IS TO PROVIDE A FORUM FOR RESEARCHERS WHO ARE INTERESTED IN THE DEVELOPMENT AND APPLICATION OF FORMAL METHODS IN INDUSTRY. IT ALSO STRIVES TO PROMOTE RESEARCH AND DEVELOPMENT FOR THE IMPROVEMENT OF FORMAL METHODS AND TOOLS FOR INDUSTRIAL APPLICATIONS.

NETWORKED SYSTEMS - MOHAMMED-AMINE KOULALI 2022

THIS BOOK CONSTITUTES THE REVISED SELECTED PAPERS OF THE 10TH INTERNATIONAL CONFERENCE ON NETWORKED SYSTEMS, NETYS 2022, HELD AS VIRTUAL EVENT, IN MAY 17-19, 2022. THE CONFERENCE WAS HELD VIRTUALLY DUE TO THE COVID-19 CRISIS. THE 18 FULL PAPERS AND 2 SHORT PAPERS PRESENTED WERE CAREFULLY REVIEWED AND SELECTED FROM 100 SUBMISSIONS. THE SCOPE OF THE CONFERENCE COVERS ALL ASPECTS RELATED TO THE DESIGN AND THE DEVELOPMENT OF THESE SYSTEMS, INCLUDING MULTI-CORE ARCHITECTURES, CONCURRENT AND DISTRIBUTED ALGORITHMS, PARALLEL/CONCURRENT/DISTRIBUTED PROGRAMMING, DISTRIBUTED DATABASES, BIG DATA APPLICATIONS AND SYSTEMS, CLOUD SYSTEMS, NETWORKS, SECURITY, AND FORMAL VERIFICATION. THEY WERE ORGANIZED IN TOPICAL SECTIONS AS FOLLOWS: DISTRIBUTED SYSTEM; NETWORKING; VERIFICATION; SECURITY.

DISTRIBUTED COMPUTING AND NETWORKING - DAVIDE FREY 2013-01-05

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 14TH INTERNATIONAL CONFERENCE ON DISTRIBUTED COMPUTING AND NETWORKING, ICDCN 2013, HELD IN MUMBAI, INDIA, DURING JANUARY 3-6, 2013. THE 27 REVISED FULL PAPERS, 5 SHORT PAPERS PRESENTED TOGETHER WITH 7 POSTER PAPERS WERE CAREFULLY REVIEWED AND SELECTED FROM 149 SUBMISSIONS. THE PAPERS COVER TOPICS SUCH AS DISTRIBUTED ALGORITHMS AND CONCURRENT DATA STRUCTURES; INTEGRATION OF HETEROGENEOUS

WIRELESS AND WIRED NETWORKS; DISTRIBUTED OPERATING SYSTEMS; INTERNETWORKING PROTOCOLS AND INTERNET APPLICATIONS; DISTRIBUTED DATABASE SYSTEMS; MOBILE AND PERVASIVE COMPUTING, CONTEXT-AWARE DISTRIBUTED SYSTEMS; EMBEDDED DISTRIBUTED SYSTEMS; NEXT GENERATION AND CONVERGED NETWORK ARCHITECTURES; EXPERIMENTS AND PERFORMANCE EVALUATION OF DISTRIBUTED SYSTEMS; OVERLAY AND PEER-TO-PEER NETWORKS AND SERVICES; FAULT-TOLERANCE, RELIABILITY, AND AVAILABILITY; HOME NETWORKING AND SERVICES; MULTIPROCESSOR AND MULTI-CORE ARCHITECTURES AND ALGORITHMS; RESOURCE MANAGEMENT AND QUALITY OF SERVICE; SELF-ORGANIZATION, SELF-STABILIZATION, AND AUTONOMIC COMPUTING; NETWORK SECURITY AND PRIVACY; HIGH PERFORMANCE COMPUTING, GRID COMPUTING, AND CLOUD COMPUTING; ENERGY-EFFICIENT NETWORKING AND SMART GRIDS; SECURITY, CRYPTOGRAPHY, AND GAME THEORY IN DISTRIBUTED SYSTEMS; SENSOR, PAN AND AD-HOC NETWORKS; AND TRAFFIC ENGINEERING, PRICING, NETWORK MANAGEMENT.

CONCURRENT PROGRAMMING: ALGORITHMS, PRINCIPLES, AND FOUNDATIONS - MICHEL RAYNAL 2015-01-29

THE ADVENT OF NEW ARCHITECTURES AND COMPUTING PLATFORMS MEANS THAT SYNCHRONIZATION AND CONCURRENT COMPUTING ARE AMONG THE MOST IMPORTANT TOPICS IN COMPUTING SCIENCE. CONCURRENT PROGRAMS ARE MADE UP OF COOPERATING ENTITIES -- PROCESSORS, PROCESSES, AGENTS, PEERS, SENSORS -- AND SYNCHRONIZATION IS THE SET OF CONCEPTS, RULES AND MECHANISMS THAT ALLOW THEM TO COORDINATE THEIR LOCAL COMPUTATIONS IN ORDER TO REALIZE A COMMON TASK. 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 SOLID 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.

EURO-PAR 2010 - PARALLEL PROCESSING - PASQUA D'AMBRA 2010-09-02

ANNOTATION THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 16TH INTERNATIONAL EURO-PAR CONFERENCE HELD IN ISCHIA, ITALY, IN AUGUST/SEPTEMBER 2010. THE 90 REVISED FULL PAPERS PRESENTED WERE CAREFULLY REVIEWED AND SELECTED FROM 256 SUBMISSIONS. THE PAPERS ARE ORGANIZED IN TOPICAL SECTIONS ON SUPPORT TOOLS AND ENVIRONMENTS; PERFORMANCE PREDICTION AND EVALUATION; SCHEDULING AND LOAD-BALANCING; HIGH PERFORMANCE ARCHITECTURES AND COMPILERS; PARALLEL AND DISTRIBUTED DATA MANAGEMENT; GRID, CLUSTER AND CLOUD COMPUTING; PEER TO PEER COMPUTING; DISTRIBUTED SYSTEMS AND ALGORITHMS; PARALLEL AND DISTRIBUTED PROGRAMMING; PARALLEL NUMERICAL ALGORITHMS; MULTICORE AND MANYCORE PROGRAMMING; THEORY AND ALGORITHMS FOR PARALLEL COMPUTATION; HIGH PERFORMANCE NETWORKS; AND MOBILE AND UBIQUITOUS COMPUTING.

PRINCIPLES OF DISTRIBUTED SYSTEMS - MICHEL RAYNAL 2009-12

OPODIS, THE INTERNATIONAL CONFERENCE ON PRINCIPLES OF DISTRIBUTED SYSTEMS, IS AN ANNUAL FORUM FOR PRESENTATION OF STATE-OF-THE-ART KNOWLEDGE ON PRINCIPLES OF DISTRIBUTED COMPUTING SYSTEMS, INCLUDING THEORY, DESIGN, ANALYSIS, IMPLEMENTATION AND APPLICATION OF DISTRIBUTED SYSTEMS, AMONG RESEARCHERS FROM AROUND THE WORLD. THE 13TH EDITION OF OPODIS WAS HELD DURING DECEMBER 15-18, IN NIMES, FRANCE. THERE WERE 71 SUBMISSIONS, AND THIS VOLUME CONTAINS THE 23 REGULAR CONTRIBUTIONS AND THE 4 BRIEF ANNOUNCEMENTS SELECTED BY THE PROGRAM COMMITTEE. ALL SUBMITTED PAPERS WERE READ AND EVALUATED BY THREE TO FIVE PC MEMBERS ASSISTED BY EXTERNAL REVIEWERS. THE FINAL DECISION REGARDING EVERY PAPER WAS TAKEN AFTER LONG DISCUSSIONS THROUGH EASYCHAIR. THIS YEAR THE BEST PAPER AWARD WAS SHARED BY TWO PAPERS: "ON THE COMPUTATIONAL POWER OF SHARED OBJECTS" BY GADI TAUBENFELD AND "TRANSACTIONAL SCHEDULING FOR READ-DOMINATED WORKLOADS" BY HAGIT ATTIA AND ALESSIA MILANI. THE BEST STUDENT PAPER AWARD WAS GIVEN TO THE PAPER "DECENTRALIZED POLLING WITH RESPECTABLE PARTICIPANTS" CO-AUTHORED BY KEVIN HUGUENIN AND MAXIME MONOD AND THEIR ADVISORS.

THE CONFERENCE ALSO FEATURED TWO VERY INTERESTING INVITED TALKS BY ANNE-MARIE KERMARREC AND MAURICE HERLIHY. ANNE-MARIE'S TALK WAS ON "NAVIGATING WEB 2.0 WITH GOSSPLE" AND MAURICE'S TALK WAS ON "TRANSACTIONAL MEMORY TODAY: A STATUS REPORT." OPODIS HAS NOW FOUND ITS PLACE AMONG THE INTERNATIONAL CONFERENCES RELATED

TOP PRINCIPLES OF DISTRIBUTED COMPUTING AND DISTRIBUTED SYSTEMS. WE HOPETHAT THIS 13TH EDITION WILL CONTRIBUTE TO THE GROWTH AND THE DEVELOPMENT OF THE CONFERENCE AND CONTINUE TO INCREASE ITS VISIBILITY. FINALLY WE WOULD LIKE TO THANK NICOLA SANTORO, CONFERENCE GENERAL CHAIR, HENRI FOUCHAL, STEERING COMMITTEE CHAIR, AND BERNARD THIBAUT FOR THEIR CONSTANT HELP.

DISTRIBUTED COMPUTING - ANDRZEJ PELC 2007-09-07

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 21ST INTERNATIONAL SYMPOSIUM ON DISTRIBUTED COMPUTING, DISC 2007, HELD IN LEMESOS, CYPRUS, IN SEPTEMBER 2007. THE 32 REVISED FULL PAPERS, SELECTED FROM 100 SUBMISSIONS, ARE PRESENTED TOGETHER WITH ABSTRACTS OF 3 INVITED PAPERS AND 9 BRIEF ANNOUNCEMENTS OF ONGOING WORKS; ALL OF THEM WERE CAREFULLY SELECTED FOR INCLUSION IN THE BOOK. THE PAPERS COVER ALL CURRENT ISSUES IN DISTRIBUTED COMPUTING - THEORY, DESIGN, ANALYSIS, IMPLEMENTATION, AND APPLICATION OF DISTRIBUTED SYSTEMS AND NETWORKS - RANGING FROM FOUNDATIONAL AND THEORETICAL TOPICS TO ALGORITHMS AND SYSTEMS ISSUES AND TO APPLICATIONS IN VARIOUS FIELDS. THIS VOLUME CONCLUDES WITH A SECTION DEVOTED TO THE 20TH ANNIVERSARY OF THE DISC CONFERENCES THAT TOOK PLACE DURING DISC 2006, HELD IN STOCKHOLM, SWEDEN, IN SEPTEMBER 2006

NETWORKED SYSTEMS - PAROSH AZIZ ABDULLA 2016-09-14

THIS BOOK CONSTITUTES THE REFEREED POST-PROCEEDINGS OF THE 4TH INTERNATIONAL CONFERENCE ON NETWORKED SYSTEMS, NETYS 2016, HELD IN MARRAKECH, MOROCCO, IN MAY 2016. THE 22 FULL PAPERS AND 11 SHORT PAPERS PRESENTED TOGETHER WITH 19 POSTER ABSTRACTS WERE CAREFULLY REVIEWED AND SELECTED FROM 121 SUBMISSIONS. THEY REPORT ON BEST PRACTICES AND NOVEL ALGORITHMS, RESULTS AND TECHNIQUES ON NETWORKED SYSTEMS AND COVER TOPICS SUCH AS MULTI-CORE ARCHITECTURES, CONCURRENT AND DISTRIBUTED ALGORITHMS, PARALLEL/CONCURRENT/DISTRIBUTED PROGRAMMING, DISTRIBUTED DATABASES, CLOUD SYSTEMS, NETWORKS, SECURITY, AND FORMAL VERIFICATION.

THE ORIGIN OF CONCURRENT PROGRAMMING - PER BRINCH HANSEN 2002-05-31

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.

STRUCTURAL INFORMATION AND COMMUNICATION COMPLEXITY - MAGNUS M. HALLDORSSON 2014-07-16

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 21ST INTERNATIONAL

COLLOQUIUM ON STRUCTURAL INFORMATION AND COMMUNICATION COMPLEXITY, SIROCCO 2014, HELD IN TAKAYAMA, JAPAN, IN JULY 2014. THE 24 FULL PAPERS PRESENTED TOGETHER WITH 5 INVITED TALKS WERE CAREFULLY REVIEWED AND SELECTED FROM 51 SUBMISSIONS. THE FOCUS OF THE COLLOQUIUM IS ON FOLLOWING SUBJECTS SHARED MEMORY AND MULTIPARTY COMMUNICATION, NETWORK OPTIMIZATION, CONGESTION ALGORITHMS AND LOWER BOUNDS, WIRELESS NETWORKS, AGGREGATION AND CREATION OF GAMES IN NETWORKS, PATROLLING AND BARRIER COVERAGE, EXPLORATION, RENDEZVOUS AND MOBILE AGENTS.

NONSEQUENTIAL AND DISTRIBUTED PROGRAMMING WITH GO - CHRISTIAN MAURER
2021-01-19

DER BAND BIETET EINE KOMPAKTE EINFÜHRUNG IN DIE NICHTSEQUENTIELLE PROGRAMMIERUNG ALS GEMEINSAMEN KERN VON VORLESUNGEN ÜBER BETRIEBSSYSTEME, VERTEILTE SYSTEME, PARALLELE ALGORITHMEN, ECHTZEITPROGRAMMIERUNG UND DATENBANKTRANSAKTIONEN. BASISKONZEPTE ZUR SYNCHRONISATION UND KOMMUNIKATION NEBENLEISTUNGSFÖHIGER PROZESSE WERDEN SYSTEMATISCH DARGESTELLT: SCHLÜSSEL, SEMAPHORE, MONITORE, LOKALER UND NETZWEITER BOTSCHAFTENAUSTAUSCH. DIE ALGORITHMEN SIND IN DER PROGRAMMIERSPRACHE GOOGLE GO FORMULIERT, MIT DER VIELE SYNCHRONISATIONSKONZEPTE AUSGEDRÜCKT WERDEN KÖNNEN.

ON CONCURRENT PROGRAMMING - FRED B. SCHNEIDER 2012-12-06

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 SCHNEIDER 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.

CONCURRENT AND DISTRIBUTED COMPUTING IN JAVA - VIJAY K. GARG 2005-01-28
CONCURRENT AND DISTRIBUTED COMPUTING IN JAVA ADDRESSES FUNDAMENTAL CONCEPTS IN CONCURRENT COMPUTING WITH JAVA EXAMPLES. THE BOOK CONSISTS OF TWO PARTS. THE FIRST PART DEALS WITH TECHNIQUES FOR PROGRAMMING IN SHARED-MEMORY BASED SYSTEMS. THE BOOK COVERS CONCEPTS IN JAVA SUCH AS THREADS, SYNCHRONIZED METHODS, WAITS, AND NOTIFY TO EXPOSE STUDENTS TO BASIC CONCEPTS FOR MULTI-THREADED PROGRAMMING. IT ALSO INCLUDES ALGORITHMS FOR MUTUAL EXCLUSION, CONSENSUS, ATOMIC OBJECTS, AND WAIT-FREE DATA STRUCTURES. THE SECOND PART OF THE BOOK DEALS WITH PROGRAMMING IN A MESSAGE-PASSING SYSTEM. THIS PART COVERS RESOURCE ALLOCATION PROBLEMS, LOGICAL CLOCKS, GLOBAL PROPERTY DETECTION, LEADER ELECTION, MESSAGE ORDERING, AGREEMENT ALGORITHMS, CHECKPOINTING, AND MESSAGE LOGGING. PRIMARILY A TEXTBOOK FOR UPPER-LEVEL UNDERGRADUATES AND GRADUATE STUDENTS, THIS THOROUGH

TREATMENT WILL ALSO BE OF INTEREST TO PROFESSIONAL PROGRAMMERS.

EURO-PAR 2015: PARALLEL PROCESSING - JESPER LARSSON TRAFF 2015-07-24

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 21ST INTERNATIONAL CONFERENCE ON PARALLEL AND DISTRIBUTED COMPUTING, EURO-PAR 2015, HELD IN VIENNA, AUSTRIA, IN AUGUST 2015. THE 51 REVISED FULL PAPERS PRESENTED TOGETHER WITH 2 INVITED PAPERS WERE CAREFULLY REVIEWED AND SELECTED FROM 190 SUBMISSIONS. THE PAPERS ARE ORGANIZED IN THE FOLLOWING TOPICAL SECTIONS: SUPPORT TOOLS AND ENVIRONMENTS; PERFORMANCE MODELING, PREDICTION AND EVALUATION; SCHEDULING AND LOAD BALANCING; ARCHITECTURE AND COMPILERS; PARALLEL AND DISTRIBUTED DATA MANAGEMENT; GRID, CLUSTER AND CLOUD COMPUTING; DISTRIBUTED SYSTEMS AND ALGORITHMS; PARALLEL AND DISTRIBUTED PROGRAMMING, INTERFACES AND LANGUAGES; MULTI- AND MANY-CORE PROGRAMMING; THEORY AND ALGORITHMS FOR PARALLEL COMPUTATION; NUMERICAL METHODS AND APPLICATIONS; AND ACCELERATOR COMPUTING.

CONCUR 2012- CONCURRENCY THEORY - MACIEJ KOUTNY 2012-09-02

THIS BOOK CONSTITUTES THE THOROUGHLY REFEREED PROCEEDINGS OF THE 23RD INTERNATIONAL CONFERENCE ON CONCURRENCY THEORY, CONCUR 2012, HELD IN NEWCASTLE UPON TYNE, UK, SEPTEMBER 4-7, 2012. THE 35 REVISED FULL PAPERS PRESENTED TOGETHER WITH 4 INVITED TALKS WERE CAREFULLY REVIEWED AND SELECTED FROM 97 SUBMISSIONS. THE PAPERS ARE ORGANIZED IN TOPICS SUCH AS REACHABILITY ANALYSIS; QUALITATIVE AND TIMED SYSTEMS; BEHAVIOURAL EQUIVALENCES; TEMPORAL LOGICS; SESSION TYPES; ABSTRACTION; MOBILITY AND SPACE IN PROCESS ALGEBRAS; STOCHASTIC SYSTEMS; PROBABILISTIC SYSTEMS; PETRI NETS AND NON-SEQUENTIAL SEMANTICS; VERIFICATION; DECIDABILITY.

PROGRAMMING ERLANG - JOE ARMSTRONG 2013-09-23

A MULTI-USER GAME, WEB SITE, CLOUD APPLICATION, OR NETWORKED DATABASE CAN HAVE THOUSANDS OF USERS ALL INTERACTING AT THE SAME TIME. YOU NEED A POWERFUL, INDUSTRIAL-STRENGTH TOOL TO HANDLE THE REALLY HARD PROBLEMS INHERENT IN PARALLEL, CONCURRENT ENVIRONMENTS. YOU NEED ERLANG. IN THIS SECOND EDITION OF THE BESTSELLING PROGRAMMING ERLANG, YOU'LL LEARN HOW TO WRITE PARALLEL PROGRAMS THAT SCALE EFFORTLESSLY ON MULTICORE SYSTEMS. USING ERLANG, YOU'LL BE SURPRISED AT HOW EASY IT BECOMES TO DEAL WITH PARALLEL PROBLEMS, AND HOW MUCH FASTER AND MORE EFFICIENTLY YOUR PROGRAMS RUN. THAT'S BECAUSE ERLANG USES SETS OF PARALLEL PROCESSES-NOT A SINGLE SEQUENTIAL PROCESS, AS FOUND IN MOST PROGRAMMING LANGUAGES. JOE ARMSTRONG, CREATOR OF ERLANG, INTRODUCES THIS POWERFUL LANGUAGE IN SMALL STEPS, GIVING YOU A COMPLETE OVERVIEW OF ERLANG AND HOW TO USE IT IN COMMON SCENARIOS. YOU'LL START WITH SEQUENTIAL PROGRAMMING, MOVE TO PARALLEL PROGRAMMING AND HANDLING ERRORS IN PARALLEL PROGRAMS, AND LEARN TO WORK CONFIDENTLY WITH DISTRIBUTED PROGRAMMING AND THE STANDARD ERLANG/OPEN TELECOM PLATFORM (OTP) FRAMEWORKS. YOU NEED NO PREVIOUS KNOWLEDGE OF FUNCTIONAL OR PARALLEL PROGRAMMING. THE CHAPTERS ARE PACKED WITH HANDS-ON, REAL-WORLD

TUTORIAL EXAMPLES AND INSIDER TIPS AND ADVICE, AND FINISH WITH EXERCISES FOR BOTH BEGINNING AND ADVANCED USERS. THE SECOND EDITION HAS BEEN EXTENSIVELY REWRITTEN. NEW TO THIS EDITION ARE SEVEN CHAPTERS COVERING THE LATEST ERLANG FEATURES: MAPS, THE TYPE SYSTEM AND THE DIALYZER, WEBSOCKETS, PROGRAMMING IDIOMS, AND A NEW STAND-ALONE EXECUTION ENVIRONMENT. YOU'LL WRITE PROGRAMS THAT DYNAMICALLY DETECT AND CORRECT ERRORS, AND THAT CAN BE UPGRADED WITHOUT STOPPING THE SYSTEM. THERE'S ALSO COVERAGE OF REBAR (THE DE FACTO ERLANG BUILD SYSTEM), AND INFORMATION ON HOW TO SHARE AND USE ERLANG PROJECTS ON GITHUB, ILLUSTRATED WITH EXAMPLES FROM COWBOY AND BITCASK. ERLANG WILL CHANGE YOUR VIEW OF THE WORLD, AND OF HOW YOU PROGRAM. WHAT YOU NEED THE ERLANG/OTP SYSTEM. DOWNLOAD IT FROM ERLANG.ORG.

CONCURRENT PATTERNS AND BEST PRACTICES - ATUL S. KHOT 2018-09-27

A DEFINITIVE GUIDE TO MASTERING AND IMPLEMENTING CONCURRENCY PATTERNS IN YOUR APPLICATIONS KEY FEATURES BUILD SCALABLE APPS WITH PATTERNS IN MULTITHREADING, SYNCHRONIZATION, AND FUNCTIONAL PROGRAMMING EXPLORE THE PARALLEL PROGRAMMING AND MULTITHREADING TECHNIQUES TO MAKE THE CODE RUN FASTER EFFICIENTLY USE THE TECHNIQUES OUTLINED TO BUILD RELIABLE APPLICATIONS BOOK 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 LEARN EXPLORE 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 PATTERNS WHO 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.

ENCYCLOPEDIA OF ALGORITHMS - MING-YANG KAO 2008-08-06

ONE OF SPRINGER'S RENOWNED MAJOR REFERENCE WORKS, THIS AWESOME ACHIEVEMENT PROVIDES A COMPREHENSIVE SET OF SOLUTIONS TO IMPORTANT ALGORITHMIC PROBLEMS FOR STUDENTS AND RESEARCHERS INTERESTED IN QUICKLY LOCATING USEFUL INFORMATION. THIS FIRST EDITION OF THE REFERENCE FOCUSES ON HIGH-IMPACT SOLUTIONS FROM THE MOST RECENT DECADE, WHILE LATER EDITIONS WILL WIDEN THE SCOPE OF THE WORK. ALL ENTRIES HAVE BEEN WRITTEN BY EXPERTS, WHILE LINKS TO INTERNET SITES THAT OUTLINE THEIR RESEARCH WORK ARE PROVIDED. THE ENTRIES HAVE ALL BEEN PEER-REVIEWED. THIS DEFINING REFERENCE IS PUBLISHED BOTH IN PRINT AND ON LINE.

SYNCHRONIZATION ALGORITHMS AND CONCURRENT PROGRAMMING - GADI TAUBENFELD 2006

THE FIRST TEXTBOOK THAT FOCUSES PURELY ON SYNCHRONIZATION - A FUNDAMENTAL CHALLENGE IN COMPUTER SCIENCE THAT IS FAST BECOMING A MAJOR PERFORMANCE AND DESIGN ISSUE FOR CONCURRENT PROGRAMMING ON MODERN ARCHITECTURES, AND FOR THE DESIGN OF DISTRIBUTED SYSTEMS.

DISTRIBUTED COMPUTING - NANCY A. LYNCH 2010-08-24

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 24TH INTERNATIONAL SYMPOSIUM ON DISTRIBUTED COMPUTING, DISC 2010, HELD IN CAMBRIDGE, CT, USA, IN SEPTEMBER 2010. THE 32 REVISED FULL PAPERS, SELECTED FROM 135 SUBMISSIONS, ARE PRESENTED TOGETHER WITH 14 BRIEF ANNOUNCEMENTS OF ONGOING WORKS; ALL OF THEM WERE CAREFULLY REVIEWED AND SELECTED FOR INCLUSION IN THE BOOK. THE PAPERS ADDRESS ALL ASPECTS OF DISTRIBUTED COMPUTING, AND WERE ORGANIZED IN TOPICAL SECTIONS ON, TRANSACTIONS, SHARED MEMORY SERVICES AND CONCURRENCY, WIRELESS NETWORKS, BEST STUDENT PAPER, CONSENSUS AND LEADER ELECTION, MOBILE AGENTS, COMPUTING IN WIRELESS AND MOBILE NETWORKS, MODELING ISSUES AND ADVERSITY, AND SELF-STABILIZING AND GRAPH ALGORITHMS.

ALGORITHMS FOR CONCURRENT SYSTEMS - RACHID GUERRAOU 2018

PRINCIPLES OF DISTRIBUTED SYSTEMS - ANTONIO FERNANDEZ ANTA 2011-12-09

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 15TH INTERNATIONAL CONFERENCE ON PRINCIPLES OF DISTRIBUTED SYSTEMS, OPODIS 2011, HELD IN TOULOUSE, FRANCE, IN DECEMBER 2011. THE 26 REVISED PAPERS PRESENTED IN THIS VOLUME WERE CAREFULLY REVIEWED AND SELECTED FROM 96 SUBMISSIONS. THEY REPRESENT THE CURRENT STATE OF THE ART OF THE RESEARCH IN THE FIELD OF THE DESIGN, ANALYSIS AND DEVELOPMENT OF DISTRIBUTED AND REAL-TIME SYSTEMS.

ALGORITHMS AND ARCHITECTURES FOR PARALLEL PROCESSING - JESUS CARRETERO 2016-11-24

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE ON ALGORITHMS AND ARCHITECTURES FOR PARALLEL PROCESSING, ICA3PP 2016, HELD IN GRANADA, SPAIN, IN DECEMBER 2016. THE 30 FULL PAPERS AND 22 SHORT

PAPERS PRESENTED WERE CAREFULLY REVIEWED AND SELECTED FROM 117 SUBMISSIONS. THEY COVER MANY DIMENSIONS OF PARALLEL ALGORITHMS AND ARCHITECTURES, ENCOMPASSING FUNDAMENTAL THEORETICAL APPROACHES, PRACTICAL EXPERIMENTAL PROJECTS, AND COMMERCIAL COMPONENTS AND SYSTEMS TRYING TO PUSH BEYOND THE LIMITS OF EXISTING TECHNOLOGIES, INCLUDING EXPERIMENTAL EFFORTS, INNOVATIVE SYSTEMS, AND INVESTIGATIONS THAT IDENTIFY WEAKNESSES IN EXISTING PARALLEL PROCESSING TECHNOLOGY.

EURO-PAR 2015: PARALLEL PROCESSING WORKSHOPS - SASCHA HUNOLD 2015-12-17

THIS BOOK CONSTITUTES THE THOROUGHLY REFEREED POST-CONFERENCE PROCEEDINGS OF 12 WORKSHOPS HELD AT THE 21ST INTERNATIONAL CONFERENCE ON PARALLEL AND DISTRIBUTED COMPUTING, EURO-PAR 2015, IN VIENNA, AUSTRIA, IN AUGUST 2015. THE 67 REVISED FULL PAPERS PRESENTED WERE CAREFULLY REVIEWED AND SELECTED FROM 121 SUBMISSIONS. THE VOLUME INCLUDES PAPERS FROM THE FOLLOWING WORKSHOPS:

BIGDATA CLOUD: 4TH WORKSHOP ON BIG DATA MANAGEMENT IN CLOUDS - EURO-EDUPAR: FIRST EUROPEAN WORKSHOP ON PARALLEL AND DISTRIBUTED COMPUTING EDUCATION FOR UNDERGRADUATE STUDENTS - HETERO PAR: 13TH INTERNATIONAL WORKSHOP ON ALGORITHMS, MODELS AND TOOLS FOR PARALLEL COMPUTING ON HETEROGENEOUS PLATFORMS - LSDVE: THIRD WORKSHOP ON LARGE SCALE DISTRIBUTED VIRTUAL ENVIRONMENTS - OMHI: 4TH INTERNATIONAL WORKSHOP ON ON-CHIP MEMORY HIERARCHIES AND INTERCONNECTS - PADAPS: THIRD WORKSHOP ON PARALLEL AND DISTRIBUTED AGENT-BASED SIMULATIONS - PELGA: WORKSHOP ON PERFORMANCE ENGINEERING FOR LARGE-SCALE GRAPH ANALYTICS - REPPAR: SECOND INTERNATIONAL WORKSHOP ON REPRODUCIBILITY IN PARALLEL COMPUTING - RESILIENCE: 8TH WORKSHOP ON RESILIENCY IN HIGH PERFORMANCE COMPUTING IN CLUSTERS, CLOUDS, AND GRIDS - ROME: THIRD WORKSHOP ON RUNTIME AND OPERATING SYSTEMS FOR THE MANY CORE ERA - UCHPC: 8TH WORKSHOP ON UNCONVENTIONAL HIGH PERFORMANCE COMPUTING - AND VHPC: 10TH WORKSHOP ON VIRTUALIZATION IN HIGH-PERFORMANCE CLOUD COMPUTING. ALGORITHMS AND PARALLEL COMPUTING - FAYEZ GEBALI 2011-03-29

THERE IS A SOFTWARE GAP BETWEEN THE HARDWARE POTENTIAL AND THE PERFORMANCE THAT CAN BE ATTAINED USING TODAY'S SOFTWARE PARALLEL PROGRAM DEVELOPMENT TOOLS. THE TOOLS NEED MANUAL INTERVENTION BY THE PROGRAMMER TO PARALLELIZE THE CODE. PROGRAMMING A PARALLEL COMPUTER REQUIRES CLOSELY STUDYING THE TARGET ALGORITHM OR APPLICATION, MORE SO THAN IN THE TRADITIONAL SEQUENTIAL PROGRAMMING WE HAVE ALL LEARNED. THE PROGRAMMER MUST BE AWARE OF THE COMMUNICATION AND DATA DEPENDENCIES OF THE ALGORITHM OR APPLICATION. THIS BOOK PROVIDES THE TECHNIQUES TO EXPLORE THE POSSIBLE WAYS TO PROGRAM A PARALLEL COMPUTER FOR A GIVEN APPLICATION.

INTRODUCTION TO PARALLEL COMPUTING - ZBIGNIEW J. CZECH 2017-01-11

THE CONSTANTLY INCREASING DEMAND FOR MORE COMPUTING POWER CAN SEEM IMPOSSIBLE TO KEEP UP WITH. HOWEVER, MULTICORE PROCESSORS CAPABLE OF PERFORMING

COMPUTATIONS IN PARALLEL ALLOW COMPUTERS TO TACKLE EVER LARGER PROBLEMS IN A WIDE VARIETY OF APPLICATIONS. THIS BOOK PROVIDES A COMPREHENSIVE INTRODUCTION TO PARALLEL COMPUTING, DISCUSSING THEORETICAL ISSUES SUCH AS THE FUNDAMENTALS OF CONCURRENT PROCESSES, MODELS OF PARALLEL AND DISTRIBUTED COMPUTING, AND METRICS FOR EVALUATING AND COMPARING PARALLEL ALGORITHMS, AS WELL AS PRACTICAL ISSUES, INCLUDING METHODS OF DESIGNING AND IMPLEMENTING SHARED- AND DISTRIBUTED-MEMORY PROGRAMS, AND STANDARDS FOR PARALLEL PROGRAM IMPLEMENTATION, IN PARTICULAR MPI AND OPENMP INTERFACES. EACH CHAPTER PRESENTS THE BASICS IN ONE PLACE FOLLOWED BY ADVANCED TOPICS, ALLOWING NOVICES AND EXPERIENCED PRACTITIONERS TO QUICKLY FIND WHAT THEY NEED. A GLOSSARY AND MORE THAN 80 EXERCISES WITH SELECTED SOLUTIONS AID COMPREHENSION. THE BOOK IS RECOMMENDED AS A TEXT FOR ADVANCED UNDERGRADUATE OR GRADUATE STUDENTS AND AS A REFERENCE FOR PRACTITIONERS.

DEPENDABLE AND HISTORIC COMPUTING - CLIFF B. JONES 2012-01-24

THIS Festschrift VOLUME, PUBLISHED IN HONOR OF BRIAN RANDELL ON THE OCCASION OF HIS 75TH BIRTHDAY, CONTAINS A TOTAL OF 37 REFEREED CONTRIBUTIONS. TWO BIOGRAPHICAL PAPERS ARE FOLLOWED BY THE SIX INVITED PAPERS THAT WERE PRESENTED AT THE CONFERENCE 'DEPENDABLE AND HISTORIC COMPUTING: THE RANDELL TALES', HELD DURING APRIL 7-8, 2011 AT NEWCASTLE UNIVERSITY, UK. THE REMAINING CONTRIBUTIONS ARE AUTHORED BY FORMER SCIENTIFIC COLLEAGUES OF BRIAN RANDELL. THE PAPERS FOCUS ON THE CORE OF BRIAN RANDELL'S WORK: THE DEVELOPMENT OF COMPUTING SCIENCE AND THE STUDY OF ITS HISTORY. MOREOVER, HIS WIDER INTERESTS ARE REFLECTED AND SO THE COLLECTION COMPRISES PAPERS ON SOFTWARE ENGINEERING, STORAGE FRAGMENTATION, COMPUTER ARCHITECTURE, PROGRAMMING LANGUAGES AND DEPENDABILITY. THERE IS EVEN A PAPER THAT ECHOES RANDELL'S LOVE OF MAPS. AFTER AN EARLY CAREER WITH ENGLISH ELECTRIC AND THEN WITH IBM IN NEW YORK AND CALIFORNIA, BRIAN RANDELL JOINED NEWCASTLE UNIVERSITY. HIS MAIN RESEARCH HAS BEEN ON DEPENDABLE COMPUTING IN ALL ITS FORMS, ESPECIALLY RELIABILITY, SAFETY AND SECURITY ASPECTS, AND HE HAS LED SEVERAL MAJOR EUROPEAN COLLABORATIVE PROJECTS.

PARALLEL COMPUTING TECHNOLOGIES - VICTOR MALYSHKIN 2011-09

THIS BOOK CONSTITUTES THE PROCEEDINGS OF THE 11TH INTERNATIONAL CONFERENCE ON PARALLEL COMPUTING TECHNOLOGIES, PACT 2011, HELD IN KAZAN, RUSSIA ON SEPTEMBER 19-23, 2011. THE 44 FULL PAPERS PRESENTED TOGETHER WITH 2 INVITED PAPERS WERE CAREFULLY REVIEWED AND SELECTED FROM 68 SUBMISSIONS. THE PAPERS ARE ORGANIZED IN TOPICAL SECTIONS ON MODELS AND LANGUAGES, CELLULAR AUTOMATA, PARALLEL PROGRAMMING TOOLS AND SUPPORT, AND APPLICATIONS.

DISTRIBUTED COMPUTING - YEHUDA AFEK 2013-10-04

THIS BOOK CONSTITUTES THE PROCEEDINGS OF THE 27TH INTERNATIONAL SYMPOSIUM ON DISTRIBUTED COMPUTING, DISC 2013, HELD IN JERUSALEM, ISRAEL, IN OCTOBER 2013. THE 27 FULL PAPERS PRESENTED IN THIS VOLUME WERE CAREFULLY REVIEWED AND SELECTED FROM 142 SUBMISSIONS; 16 BRIEF ANNOUNCEMENTS ARE ALSO INCLUDED. THE PAPERS ARE

ORGANIZED IN TOPICAL SECTIONS NAMED: GRAPH DISTRIBUTED ALGORITHMS; TOPOLOGY, LEADER ELECTION, AND SPANNING TREES; SOFTWARE TRANSACTIONAL MEMORY; SHARED MEMORY EXECUTIONS; SHARED MEMORY AND STORAGE; GOSSIP AND RUMOR; SHARED MEMORY TASKS AND DATA STRUCTURES; ROUTING; RADIO NETWORKS AND THE SINR MODEL; CRYPTO, TRUST, AND INFLUENCE; AND NETWORKING.

DISTRIBUTED COMPUTING PEARLS - GADI TAUBENFELD 2022-05-31

COMPUTERS AND COMPUTER NETWORKS ARE ONE OF THE MOST INCREDIBLE INVENTIONS OF THE 20TH CENTURY, HAVING AN EVER-EXPANDING ROLE IN OUR DAILY LIVES BY ENABLING COMPLEX HUMAN ACTIVITIES IN AREAS SUCH AS ENTERTAINMENT, EDUCATION, AND COMMERCE. ONE OF THE MOST CHALLENGING PROBLEMS IN COMPUTER SCIENCE FOR THE 21ST CENTURY IS TO IMPROVE THE DESIGN OF DISTRIBUTED SYSTEMS WHERE COMPUTING DEVICES HAVE TO WORK TOGETHER AS A TEAM TO ACHIEVE COMMON GOALS. IN THIS BOOK, I HAVE TRIED TO GENTLY INTRODUCE THE GENERAL READER TO SOME OF THE MOST FUNDAMENTAL ISSUES AND CLASSICAL RESULTS OF COMPUTER SCIENCE UNDERLYING THE DESIGN OF ALGORITHMS FOR DISTRIBUTED SYSTEMS, SO THAT THE READER CAN GET A FEEL OF THE NATURE OF THIS EXCITING AND FASCINATING FIELD CALLED DISTRIBUTED COMPUTING. THE BOOK WILL APPEAL TO THE EDUCATED LAYPERSON AND REQUIRES NO COMPUTER-RELATED BACKGROUND. I STRONGLY SUSPECT THAT ALSO MOST COMPUTER-KNOWLEDGEABLE READERS WILL BE ABLE TO LEARN SOMETHING NEW.

MASTERING CONCURRENCY PROGRAMMING WITH JAVA 9 - JAVIER FERNANDEZ GONZALEZ 2017-07-17

MASTER THE PRINCIPLES TO MAKE APPLICATIONS ROBUST, SCALABLE AND RESPONSIVE ABOUT THIS BOOK IMPLEMENT CONCURRENT APPLICATIONS USING THE JAVA 9 CONCURRENCY API AND ITS NEW COMPONENTS IMPROVE THE PERFORMANCE OF YOUR APPLICATIONS AND PROCESS MORE DATA AT THE SAME TIME, TAKING ADVANTAGE OF ALL OF YOUR RESOURCES CONSTRUCT REAL-WORLD EXAMPLES RELATED TO MACHINE LEARNING, DATA MINING, NATURAL LANGUAGE PROCESSING, AND MORE WHO THIS BOOK IS FOR THIS BOOK IS FOR COMPETENT JAVA DEVELOPERS WHO HAVE BASIC UNDERSTANDING OF CONCURRENCY, BUT KNOWLEDGE OF EFFECTIVE IMPLEMENTATION OF CONCURRENT PROGRAMS OR USAGE OF STREAMS FOR MAKING PROCESSES MORE EFFICIENT IS NOT REQUIRED WHAT YOU WILL LEARN MASTER THE PRINCIPLES THAT EVERY CONCURRENT APPLICATION MUST FOLLOW SEE HOW TO PARALLELIZE A SEQUENTIAL ALGORITHM TO OBTAIN BETTER PERFORMANCE WITHOUT DATA INCONSISTENCIES AND DEADLOCKS GET THE MOST FROM THE JAVA CONCURRENCY API COMPONENTS SEPARATE THE THREAD MANAGEMENT FROM THE REST OF THE APPLICATION WITH THE EXECUTOR COMPONENT EXECUTE PHASED-BASED TASKS IN AN EFFICIENT WAY WITH THE PHASER COMPONENTS SOLVE PROBLEMS USING A PARALLELIZED VERSION OF THE DIVIDE AND CONQUER PARADIGM WITH THE FORK / JOIN FRAMEWORK FIND OUT HOW TO USE PARALLEL STREAMS AND REACTIVE STREAMS IMPLEMENT THE “MAP AND REDUCE” AND “MAP AND COLLECT” PROGRAMMING MODELS CONTROL THE CONCURRENT DATA STRUCTURES AND SYNCHRONIZATION MECHANISMS PROVIDED BY THE JAVA CONCURRENCY

API IMPLEMENT EFFICIENT SOLUTIONS FOR SOME ACTUAL PROBLEMS SUCH AS DATA MINING, MACHINE LEARNING, AND MORE IN DETAIL CONCURRENCY PROGRAMMING ALLOWS SEVERAL LARGE TASKS TO BE DIVIDED INTO SMALLER SUB-TASKS, WHICH ARE FURTHER PROCESSED AS INDIVIDUAL TASKS THAT RUN IN PARALLEL. JAVA 9 INCLUDES A COMPREHENSIVE API WITH LOTS OF READY-TO-USE COMPONENTS FOR EASILY IMPLEMENTING POWERFUL CONCURRENCY APPLICATIONS, BUT WITH HIGH FLEXIBILITY SO YOU CAN ADAPT THESE COMPONENTS TO YOUR NEEDS. THE BOOK STARTS WITH A FULL DESCRIPTION OF THE DESIGN PRINCIPLES OF CONCURRENT APPLICATIONS AND EXPLAINS HOW TO PARALLELIZE A SEQUENTIAL ALGORITHM. YOU WILL THEN BE INTRODUCED TO THREADS AND RUNNABLES, WHICH ARE AN INTEGRAL PART OF JAVA 9’S CONCURRENCY API. YOU WILL SEE HOW TO USE ALL THE COMPONENTS OF THE JAVA CONCURRENCY API, FROM THE BASICS TO THE MOST ADVANCED TECHNIQUES, AND WILL IMPLEMENT THEM IN POWERFUL REAL-WORLD CONCURRENCY APPLICATIONS. THE BOOK ENDS WITH A DETAILED DESCRIPTION OF THE TOOLS AND TECHNIQUES YOU CAN USE TO TEST A CONCURRENT JAVA APPLICATION, ALONG WITH A BRIEF INSIGHT INTO OTHER CONCURRENCY MECHANISMS IN JVM. STYLE AND APPROACH THIS IS A COMPLETE GUIDE THAT IMPLEMENTS REAL-WORLD EXAMPLES OF ALGORITHMS RELATED TO MACHINE LEARNING, DATA MINING, AND NATURAL LANGUAGE PROCESSING IN CLIENT/SERVER ENVIRONMENTS. ALL THE EXAMPLES ARE EXPLAINED USING A STEP-BY-STEP APPROACH.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS - 1992

SCALABLE PARALLEL PROGRAMMING APPLIED TO H.264/AVC DECODING - BEN JUURLINK 2012-06-01

EXISTING SOFTWARE APPLICATIONS SHOULD BE REDESIGNED IF PROGRAMMERS WANT TO BENEFIT FROM THE PERFORMANCE OFFERED BY MULTI- AND MANY-CORE ARCHITECTURES. PERFORMANCE SCALABILITY NOW DEPENDS ON THE POSSIBILITY OF FINDING AND EXPLOITING ENOUGH THREAD-LEVEL PARALLELISM (TLP) IN APPLICATIONS FOR USING THE INCREASING NUMBERS OF CORES ON A CHIP. VIDEO DECODING IS AN EXAMPLE OF AN APPLICATION DOMAIN WITH INCREASING COMPUTATIONAL REQUIREMENTS EVERY NEW GENERATION. THIS IS DUE, ON THE ONE HAND, TO THE TREND TOWARDS HIGH QUALITY VIDEO SYSTEMS (HIGH DEFINITION AND FRAME RATE, 3D DISPLAYS, ETC) THAT RESULTS IN A CONTINUOUS INCREASE IN THE AMOUNT OF DATA THAT HAS TO BE PROCESSED IN REAL-TIME. ON THE OTHER HAND, THERE IS THE REQUIREMENT TO MAINTAIN HIGH COMPRESSION EFFICIENCY WHICH IS ONLY POSSIBLE WITH VIDEO CODES LIKE H.264/AVC THAT USE ADVANCED CODING TECHNIQUES. IN THIS BOOK, THE PARALLELIZATION OF H.264/AVC DECODING IS PRESENTED AS A CASE STUDY OF PARALLEL PROGRAMMING. H.264/AVC DECODING IS AN EXAMPLE OF A COMPLEX APPLICATION WITH MANY LEVELS OF DEPENDENCIES, DIFFERENT KERNELS, AND IRREGULAR DATA STRUCTURES. THE BOOK PRESENTS A DETAILED METHODOLOGY FOR PARALLELIZATION OF THIS TYPE OF APPLICATIONS. IT BEGINS WITH A DESCRIPTION OF THE ALGORITHM, AN ANALYSIS OF THE DATA DEPENDENCIES AND AN EVALUATION OF THE DIFFERENT PARALLELIZATION STRATEGIES. THEN THE DESIGN AND IMPLEMENTATION OF A NOVEL

PARALLELIZATION APPROACH IS PRESENTED THAT IS SCALABLE TO MANY CORE ARCHITECTURES. EXPERIMENTAL RESULTS ON DIFFERENT PARALLEL ARCHITECTURES ARE

DISCUSSED IN DETAIL. FINALLY, AN OUTLOOK IS GIVEN ON PARALLELIZATION OPPORTUNITIES IN THE UPCOMING HEVC STANDARD.