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Yves Demazeau, LIG, CNRS-Université de Grenoble
Yassine Lakhnech, VERIMAG, Université Joseph Fourier, Grenoble
Imad Saleh, Université Paris 8

Agent-oriented Programming
Artificial Intelligence
Computational Biology
Computer Security and Formal Verification
Data Management
High Performance Computing
Image Processing
Information Systems

Knowledge Engineering
Language Processing and Communication
Language / Speech Recognition
Multimedia
Operations Research
Programming Languages
Software Engineering
Theoretical Computer Science
Forthcoming Sets

Communicating Drones coordinated by Nicolas Larrieu
Functional Data Analysis coordinated by Frédéric Ferraty
Metaheuristics coordinated by Nicolas Monmarché, Patrick Siarry
Software-based Safety Systems coordinated by Jean-Louis Boulanger

Forthcoming Titles

Abstract Domains in Constraint Programming by Pelleau Marie
Advanced Graph Theory and Combinatorics by Rigo Michel
Certifiable Software Applications by Boulanger Jean-Louis
Data Quality in Practices by Berti-Equille Laure
Data Validation by Boulanger Jean-Louis
Enterprise Interoperability I-ESA’14 by Lauras Matthieu et al.
Floating-point Algorithms and Formal Proofs by Boldo Sylvie, Melquiond Guillaume
Min-plus Algebraic Networks by Boyer Marc, Bouillard Anne, Le Corronc Euriel
Mined Individuals in Large Networks by Prieur Christophe
Optimization for Aeronautical Applications by Morlier Joseph
Parallel Computing by Magoules Frédéric, Roux François-Xavier, Houzeaux Guillaume
Safety of Software-based Systems by Boulanger Jean-Louis
SCADE / Language and Applications
   by Boulanger Jean-Louis, Fornari François-Xavier, Camus Jean-Louis, Dion Bernard
Visual Inspection Technology in the Hard Disc Drive Industry by Muneesawang Paisarn, Yammen Suchart
Worst-case Performance in Networks by Boyer Marc, Bouillard Anne, Le Corronc Euriel

Sets – Forthcoming and published Titles

Metaheuristics

Coordinated by Nicolas Monmarché, Université de Tours, France
and Patrick Siarry, UPEC - Université Paris-Est Créteil

Evolutionary Algorithms by Petrowski Alain, Ben-Hamida Sana, Michalewicz Zbigniew
Evolutionary Algorithms for Food Science and Technology by Lutton Evelyne, Tonda Alberto, Perrot Nathalie
Evolutionary Computation with Biogeography-based Optimization by Ergezer Mehmet, Simon Dan
Guided Randomness in Optimization by Clerc Maurice
Metaheuristics for Logistics by Deroussi Laurent
Metaheuristics for Air Traffic Management by Durand Nicolas, Gianazza David, Gotteland Jean-Baptiste, Alliot Jean-Marc
Metaheuristics for Big Data by Jourdan Laetitia, Dhaenens Clarisse
Metaheuristics for Intelligent Electrical Networks by Héliodore Frédéric, Ismail Boussaad, Poullain Serge, Nakib Amir
Metaheuristics for String Problems in Bio-informatics by Blum Christian, Festa Paola
Metaheuristics for Vehicle Routing Problems by Labadie Nacima, Prins Christian, Prodhon Caroline
The performance of a computer network is among the key elements that determine its operational quality; performance evaluation cannot be only treated empirically.

This book presents the two most commonly used methodologies for performance evaluation in computer networks: simulation using specialized software and mathematical modeling. A large part is dedicated to simulation, especially within its theoretical framework, and the precautions which need to be taken in the implementation and experimental procedure. These principles are illustrated by concrete examples realized through the OMNeT++ simulation framework.

The mathematical method (queueing theory, Markov process) is presented as an indispensable complementary approach to simulation. Both methodologies are based largely on the theory of probability, and statistics. A reminder of the basic results is also available.
Increasing needs in computing power are satisfied nowadays by federating more and more computers (or nodes) to build distributed infrastructures. Historically, these infrastructures have been managed by means of user-space frameworks or distributed operating systems.

Over the past few years, a new kind of software manager has appeared, managers that rely on system virtualization. System virtualization allows the software to be disassociated from the underlying node by encapsulating it in a virtual machine.

The contribution of this book lies precisely in this area of research; more specifically, the author proposes DVMS (Distributed Virtual Machine Scheduler), a more decentralized application to dynamically schedule virtual machines hosted on a distributed infrastructure. These virtual machines are created, deployed on nodes and managed during their entire lifecycle by virtual infrastructure managers (VIMs). Ways to improve the scalability of VIMs are proposed, one of which consists of decentralizing the processing of several management tasks.

The aim of this book is expose optimization problems that can be expressed as graphs, by detailing, for each studied problem, the set of nodes and the set of edges.

The authors propose, for each studied problem, a greedy algorithm as a problem-specific heuristic and a genetic algorithm as a metaheuristic.
Computer Engineering
Published Titles

Musical Rhetoric
Foundations and Annotation Schemes
Patrick Saint-Dizier, ILPL research group, Toulouse, France

Coordinated by Jean-Charles Pomeroi

ISBN: 97818484215610 • 2014 • 208 pages • USD 80.00 • ISTE-WILEY

This book explores the various roles played by music in a rhetoric discourse or in an argumentative construction. The author develops the computer modeling of a number of simple and relatively commonly accepted aspects of music rhetoric. Therefore, in addition to an analysis of musical features that are important to rhetoric, this book introduces computational formalisms and representations used particularly in computational linguistics which turn out to be appropriate and sufficiently expressive for an analysis of music rhetoric.

Contents
1. An Introduction to Classical Rhetoric.
5. A Rhetoric Analysis of Musical Works.

Formal Methods Applied to Industrial Complex Systems
Edited by Jean-Louis Boulanger, Consultant

Coordinated by Jean-Charles Pomeroi

ISBN: 97818484216327 • 2014 • 480 pages • USD 185.00 • ISTE-WILEY

This book presents a summary of experience on the use of "formal methods" (such as proof and model-checking) in industrial examples of complex systems, based on the experience of people currently involved in the creation and evaluation of safety critical system software.

The authors cover the following topics: the use of SCADE, constraint solving in B, validation of Petri Nets-based automated rail safety, Mitsubichi, Clearsy, the B-method, B extended to flight, which is sufficient to prove avionics software, data validation with ProB, proof with new GNATprove tools.

Contents
1. Formal Description and Modeling of Risks.
2. An Innovative Approach and an Adventure in Rail Safety.
4. Safety Demonstration for a Rail Signaling Application in Nominal and Degraded Modes using Formal Proof.
5. Formal Verification of Data for Parameterized Systems.
6. ERTMS Modeling using EFS.
7. The Use of a "Model-based Design" Approach on an ERTMS Level 2 Ground System.
8. Applying Abstract Interpretation to Demonstrate Functional Safety.
10. Validation of Railway Security Automatisms Based on Petri Networks.

Formal Methods Applied to Complex Systems
Implementation of the B Method
Edited by Jean-Louis Boulanger, Consultant

Coordinated by Jean-Charles Pomeroi

ISBN: 97818484217096 • 2014 • 512 pages • USD 195.00 • ISTE-WILEY

This book presents real-world examples of formal techniques in an industrial context. It covers formal methods such as SCADE and/or the B Method, in various fields such as railways, aeronautics, and the automotive industry.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=762
Rapid Prototyping of Software for Avionics Systems
Model-oriented Approaches for Complex Systems Certification
Nicolas Larrieu and Antoine Varet, ENAC (French Civil Aviation University), France

Coordinated by Guy Pujolle

ISBN: 9781848217645 • 2014 • 152 pages • USD 90.00 • ISTE-WILEY

The design, implementation and validation of avionics and aeronautical systems have become extremely complex tasks due to the increase of functionalities that are deployed in current avionics systems and the need to be able certify them before putting them into production.

This book proposes a methodology to enable the rapid prototyping of such a system by considering from the start the certification aspects of the solution produced. This method takes advantage of the model-based design approaches as well as the use of formal methods for the validation of these systems. Furthermore, the use of automatic software code generation tools using models makes it possible to reduce the development phase as well as the final solution testing.

This book presents, firstly, an overview of the model-based design approaches such as those used in the field of aeronautical software engineering. Secondly, an original methodology that is perfectly adapted to the field of aeronautical embedded systems is introduced. Finally, the authors illustrate the use of this method using a case study for the design, implementation and testing of a new generation aeronautical router.

Enterprise Interoperability
Interoperability for Agility, Resilience and Plasticity of Collaborations
Edited by Matthieu Lauras Martin Zelm Bernard Archimède Frédérick Bénaben and Guy Doumeingts

Computer Engineering Series

ISBN: 9781848217997 • 2014 • 356 pages • USD 155.00 • ISTE-WILEY

The workshop proceedings report on Methods in the Future Internet, Architectures and ICT services with regard to Digital Business Innovation in Manufacturing. They address applications of advanced technologies in the health sector, in smart nets city logistics and in crisis management and cover standardization developments for Enterprise Interoperability in the Manufacturing Service Domain.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=828
Software Architecture 1
Edited by Mourad Chabane Oussalah, University of Nantes, France

Contents
1. Object-Oriented, Component-Based, Agent-Oriented and Service-Oriented Paradigms in Software Architectures.
2. Reference Architectures.
5. Software Architecture for Product Lines.

Software Architecture 2
Edited by Mourad Chabane Oussalah, University of Nantes, France

Contents
1. Metamodeling in Software Architectures.
3. Software Architectures and Multiple Variability.
5. Software Architectures and Multiagent Systems.

COBOL Software Modernization
From Principles to Implementation with the BLU AGE® Method
Franck Barbier, University of Pau, France, Jean-Luc Recoussine, BLU AGE® Corporation, Dallas, Texas

Contents
4. Service-Oriented Architecture (SOA).
5. SOA in Action. – 6. Model-Driven Development (MDD).
7. Model-Driven Software Modernization.
Advanced Backend Code Optimization
Sid Touati, University Nice Sophia Antipolis, Benoit Dupont de Dinechin, Kalray, France

Coordinated by Jean-Charles Pomerol

ISBN: 9781848215382 • 2014 • 384 pages • USD 149.00 • ISTE-WILEY

A summary of more than a decade of research in the area of backend code optimization for high performance and embedded computing, this book contains the latest fundamental and technical research results in this field at an advanced level.

With chapters on phase ordering in optimizing compilation, register saturation in instruction level parallelism, code size reduction for software pipelining, memory hierarchy effects in instruction-level parallelism, and rigorous statistical performance analysis, it covers material not previously covered by books in the field. Other chapters provide the latest research results in well-known topics such as instruction scheduling and its relationship with machine scheduling theory, register need, software pipelining and periodic register allocation.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=608

Time-Predictable Architectures
Christine Rochange and Pascal Sainrat, Paul Sabatier University, Toulouse, France, Sascha Uhrig, Technical University of Dortmund, Germany

Coordinated by Luis Farinas

ISBN: 9781848215931 • 2014 • 192 pages • USD 85.00 • ISTE-WILEY

Time-Predictable Architectures is concerned with building computers that can be used to design embedded real-time systems. Real-time embedded software requires increasingly higher performances, which leads the authors to consider processors that implement advanced mechanisms such as pipelining, out-of-order execution, branch prediction, cache memories, multithreading, multicore architectures, etc. The authors investigate the time-predictability of such schemes.

Contents
4. Memory Hierarchy.
5. Multicores.
6. Example Architectures.

Modeling and Optimization of Air Traffic
Daniel Delahaye and Stéphane Puechmorel, ENAC, France

Coordinated by Narendra Jussien

ISBN: 9781848215955 • 2013 • 352 pages • USD 135.00 • ISTE-WILEY

The authors’ research is linked with the attempt to reduce airspace congestion in Western Europe, USA and, increasingly, Asia.

Contents
1. Introduction.
   Part 1. Optimization and Artificial Evolution
   Part 2. Applications to Air Traffic Control
Enterprise Interoperability
Research and Applications in the Service-oriented Ecosystem
Edited by Martin Zelm, Marten van Sinderen, Luis Ferraira Pires and Guy Doumeingts

In a fast changing global economy governed by Enterprise Services and the Future Internet, enterprises and virtual factories will self-organize in distributed, interoperable, innovation Ecosystems where the issues of Enterprise Interoperability need to be solved in a multi-view of information, services and processes throughout Enterprise Networks.

The book constitutes the proceedings of five workshops co-located with the Fifth IFIP Working Conference IWEI 2013. It contains the presented peer reviewed papers and summaries of the workshop discussions.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=715

ISBN: 9781848216624 • 2013 • 272 pages • USD 120.00 • ISTE-WILEY

Man–Machine Dialogue
Design and Challenges
Frédéric Landragin, CNRS, France

This book summarizes the main problems posed by the design of a man–machine dialogue system and offers ideas on how to continue along the path towards efficient, realistic and fluid communication between humans and machines.

Contents

Part 1. Historical and Methodological Landmarks

Part 2. Inputs Processing

Part 3. System Behavior and Evaluation

ISBN: 9781848214576 • 2013 • 240 pages • USD 85.00 • ISTE-WILEY

Algorithms and Ordering Heuristics for Distributed Constraint Satisfaction Problems
Mohamed Wahbi, Ecole des Mines de Nantes, France

A wide variety of problems in artificial intelligence are solved using the constraint satisfaction problem paradigm. However, there are several applications in multi-agent coordination that are of a distributed nature. In this type of application, the knowledge about the problem, that is, variables and constraints, may be logically or geographically distributed among physical distributed agents.

This distribution is mainly due to privacy and/or security requirements. Therefore, a distributed model allowing a decentralized solving process is more adequate to model and solve such kinds of problem. The distributed constraint satisfaction problem has such properties.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=606

ISBN: 9781848215948 • 2013 • 176 pages • USD 75.00 • ISTE-WILEY
Safety Management for Software-based Equipment
Jean-Louis Boulanger, CERTIFER, France

Coordinated by Jean-Charles Pomerol

ISBN: 9781848214521 • 2013 • 192 pages • USD 95.00 • ISTE-WILEY

This book shows how it is possible to define a safety architecture (including redundancy, diversification, error-detection techniques) on the basis of safety objectives and how to identify objectives related to software programs.

From software objectives, the author presents the different safety techniques (fault detection, redundancy and quality control). “Certifiable system” aspects are taken into account throughout the book.

Contents

1. Safety Management.
2. From System to Software.
3. Certifiable System.
4. Risk and Safety Levels.
7. Certification.

LMF — Lexical Markup Framework
Edited by Gil Francopoulo, Tagmatica, Paris, France

Coordinated by Patrick Paroubek

ISBN: 9781848214309 • 2013 • 288 pages • USD 125.00 • ISTE-WILEY

The descriptions range from morphology, syntax and computational semantics to computer-assisted translation. The languages covered are not restricted to European languages, but apply to all natural languages.

The LMF specification is now a success and numerous lexicon managers currently use LMF in different languages and contexts.

Complete table of contents at http://www.iste.co.uk/index.php?f=a&ACTION=View&id=566

The Inverse Method
Parametric Verification of Real-time Embedded Systems
Etienne André, University Paris 13 and Romain Soulat, ENS Cachan, France

Coordinated by Jean-Charles Pomerol

ISBN: 9781848214477 • 2013 • 176 pages • USD 90.00 • ISTE-WILEY

This book introduces state-of-the-art verification techniques for real-time embedded systems, based on the inverse method for parametric timed automata.

Contents

1. Parametric Timed Automata.
2. The Inverse Method for Parametric Timed Automata.
3. The Inverse Method in Practice: Application to Case Studies.
5. Parameter Synthesis for Hybrid Automata.
6. Application to the Robustness Analysis of Scheduling Problems.
7. Conclusion and Perspectives.
Constraint Satisfaction Problems
CSP Formalisms and Techniques
Khaled Ghédira, University of Tunis, Tunisia

Coordinated by Bernard Dubuisson

ISBN: 9781848214606 • 2013 • 240 pages • USD 95.00 • ISTE-WILEY

This book introduces the classic CSP and details several extensions/improvements of both formalisms and techniques in order to tackle a large variety of problems. Consistency, flexible, dynamic, distributed and learning aspects are discussed and illustrated using simple examples such as the n-queen problem.

Contents
1. Foundations of CSP.
2. Consistency Reinforcement Techniques.
3. CSP Solving Algorithms.
7. Constraint Satisfaction and Optimization Problems.
8. Distributed Constraint Satisfaction Problems.

Memory Allocation Problems in Embedded Systems
Optimization Methods
Maria Soto, IUT de Vannes, Marc Sevaux, André Rossi and Johann Laurent, University of Southern Brittany, Lorient, France

Coordinated by Narendra Jussien

ISBN: 9781848214286 • 2012 • 208 pages • USD 90.00 • ISTE-WILEY

A state of the art of optimization techniques for memory management and data assignment is presented in this book.

Contents
2. Unconstrained Memory Allocation Problem.
3. Memory Allocation Problem with Constraint on the Number of Memory Banks.
4. General Memory Allocation Problem.
5. Dynamic Memory Allocation Problem.
7. General Conclusions and Future Work.

Computer Science and Ambient Intelligence
Gaëlle Calvary, Grenoble INP, Thierry Delot, University of Valenciennes, Florence Sèdes, Paul Sabatier University, Toulouse and Jean-Yves Tigli, University of Nice Sophia Antipolis, France

computer engineering series

ISBN: 9781848214378 • 2012 • 352 pages • USD 145.00 • ISTE-WILEY

This book focuses on ambient intelligence and addresses various issues related to data management, networking and HCI in this context.

Contents
For reasons of clarity, the authors have deliberately chosen examples that apply to machines from all eras, without having to water down the contents of the book.

Contents

Part 1. Elements of a Basic Architecture
1. Introduction. – 2. The Basic Modules. – 3. The Representation of Information.
Part 2. Programming Model and Operation

Program Specialization

Renaud Marlet, École des Ponts ParisTech, France

ISBN: 9781848213999 • 2012 • 560 pages • USD 195.00 • ISTE-WILEY

This book presents the principles and techniques of program specialization, a general method to make programs faster (and possibly smaller) when some inputs can be known in advance.

Contents


Model-Driven and Software Product Line Engineering

Hugo Arboleda, ICESI University, Cali, Colombia and Jean-Claude Royer, Ecole des Mines de Nantes, France

ISBN: 9781848214279 • 2012 • 288 pages • USD 125.00 • ISTE-WILEY

This book introduces both Software Product Lines and Model-Driven Engineering, which have separate success stories in industry, and focuses on the practical combination of them. It describes the challenges and benefits of merging these two software development trends and provides the reader with a novel approach and practical mechanisms to improve software development productivity.

Contents

Industrial Use of Formal Methods
Formal Verification
Edited by Jean-Louis Boulanger, CERTIFER, France

Contents
1. From Classic Languages to Formal Methods.
4. Proving Global Properties with the Aid of the SIMULINK DESIGN VERIFIER Proof Tool.

Formal Methods
Industrial Use from Model to the Code
Edited by Jean-Louis Boulanger, CERTIFER, France

Contents
1. SPARK – A Language and Tool-Set for High-Integrity Software Development.
4. Polyspace®.
5. Escher Verification Studio Perfect Developer and Escher C Verifier.
8. Conclusion.

Assembly Language Programming
ARM Cortex-M3
Vincent Mahout, LAAS-INSA, France

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3. The Proper Use of Assembly Directives. – 4. Operands of Instructions.
5. Instruction Set. – 6. Algorithmic and Data Structures.
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<td>Christophe Lecoutre, Artois University, France</td>
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Graph Theory and Applications
*With Exercises and Problems*
Jean-Claude Fournier, University Pierre and Marie Curie, Paris, France
9781848210707 • 2009 • 288 pages • USD 135.00

Nanocomputers and Swarm Intelligence
Jean-Baptiste Waldner, Consultant, France
9781848210097 • 2008 • 304 pages • USD 160.00

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