Computational Electromagnetics And Model Based Inversion A Modern Paradigm For Eddy Current Nondestructive Evaluation Scientific Computation

Model-Based Engineering of Embedded Real-Time Systems Model-Based Design for Embedded Systems **Practical Model-based Systems Engineering** How to Engineer Software **Model-Based Design and Evaluation of Interactive Applications** *Model-Based Systems Engineering with OPM and SysML* **Agile Model-Based Development Using UML-RSDS Optimal Experimental Design for Chemical Engineers Simulation and Model-Based Methodologies: An Integrative View** Republic of Mozambique: Technical Assistance Report-Inflation Targeting and Model-based Monetary Policy Analysis *Model-Based Reasoning* **Model-Based Demography** Model-Based Reasoning in Science and Technology **Model-Based Systems Engineering An Introduction to Model-Based Survey Sampling with Applications** Autonomous, Model-Based Diagnosis Agents **Practical Model-Based Testing Model-Based Approaches to Learning Model-Based Evaluation of Antimicrobial Agents in Children** *Model-Based Engineering of Embedded Systems* Model-Based Software Performance Analysis *Model-Based Control of Networked Systems* **Model-Based Testing Essentials - Guide to the ISTQB Certified Model-Based Tester** Model-Based Tools for Pharmaceutical Manufacturing Processes Quality-driven Reuse of Model-based Software Architecture Elements Model-Based Reinforcement Learning Model-based System Management for Multi-tiered Servers *Quantitative Systems Pharmacology Model-Based Safety and Assessment* **Model-Based Safety and Assessment Robust Integration of Model-Based Fault Estimation and Fault-Tolerant Control Model-based Fault Diagnosis in Dynamic Systems Using Identification Techniques** *Software Quality. Model-Based Approaches for Advanced Software and Systems Engineering Signal Processing* **Model-Based Testing for Embedded Systems** Model-Based Systems Engineering with Object-Process Methodology and SysML **Model-based Systems Architecting** *Conceptual Model-Based Problem Solving* eWork and eBusiness in Architecture, Engineering and Construction *Formal Methods*

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Model-Based Engineering of Embedded Real-Time Systems Nov 01 2022 Thetopicof"Model-BasedEngineeringofReal-TimeEmbeddedSystems"brings together a challenging problem domain (real-time embedded systems) and a - lution domain (model-based engineering). It is also at the forefrontof integrated software and systems engineering, as software in this problem domain is an essential tool for system implementation and integration. Today, real-time - bedded software plays a crucial role in most advanced technical systems such as airplanes, mobile phones, and cars, and has become the main driver and - cilitator for innovation. Development, evolution, veri?cation, con?guration, and maintenance of embedded and distributed software nowadays are often serious challenges as drastic increases in complexity can be observed in practice. Model-based engineering in general, and model-based software development in particular, advocates the notion of using models throughout the development and life-cycle of an engineered system. Model-based software engineering re- forces this notion by promoting models not only as the tool of abstraction, but also as the tool for veri?cation, implementation, testing, and maintenance. The application of such model-based engineering techniques to embedded real-time systems appears to be a good candidate to tackle some of the problems arising in the problem domain.

Model-Based Control of Networked Systems Jan 11 2021 This monograph introduces a class of networked control systems (NCS) called model-based networked control systems (MB-NCS) and presents various architectures and control strategies designed to improve the performance of NCS. The overall performance of NCS considers the appropriate use of network resources, particularly network bandwidth, in conjunction with the desired response of the system being controlled. The book begins with a detailed description of the basic MB-NCS architecture that provides stability conditions in terms of state feedback updates. It also covers typical problems in NCS such as network delays, network scheduling, and data quantization, as well as more general control problems such as output feedback control, nonlinear systems stabilization, and tracking control. Key features and topics include: Time-triggered and event-triggered feedback updates Stabilization of uncertain systems subject to time delays, quantization, and extended absence of feedback Optimal control analysis and design of model-based networked systems Parameter identification and adaptive stabilization of systems controlled over networks The MB-NCS approach to decentralized control of distributed systems Model-Based Control of Networked Systems will appeal to researchers, practitioners, and graduate students interested in the control of networked systems, distributed systems, and systems with limited feedback.

Model-Based Reasoning in Science and Technology Oct 20 2021 This book contains contributions presented during the international conference on Model-Based Reasoning (MBR ́012), held on June 21-23 in Sestri Levante, Italy. Interdisciplinary researchers discuss in this volume how scientific cognition and other kinds of cognition make use of models, abduction, and explanatory reasoning in order to produce important or creative changes in theories and concepts. Some of the contributions analyzed the problem of model-based reasoning in technology and stressed the issues of scientific and technological innovation. The book is divided in three main parts: models, mental models, representations; abduction, problem solving and practical reasoning; historical, epistemological and technological issues. The volume is based on the papers that were presented at the international

Model-Based Systems Engineering Sep 18 2021 Model-Based Systems Engineering explains the fundamental theories behind model-based systems and the considerations involved in applying theory to the design of real systems. The book begins by presenting terms used in systems engineering and introducing the discrete system and its components. The remainder of the text explains topics such as the mathematical theory of system coupling, the homomorphic relationship between systems, the concept of system mode, the mathematical structure of T3SD system requirements, and the implications of that structure for T3SD system design. Appendices include a short bibliography, detailed definitions of all examples discussed in the text, a list of all notations used, and an index. Model-Based Systems Engineering is an excellent text for engineering students, and an invaluable reference for engineers and scientists.

Model-Based Demography Nov 20 2021 Late in a career of more than sixty years, Thomas Burch, an internationally known social demographer, undertook a wide-ranging methodological critique of demography. This open access volume contains a selection of resulting papers, some previously unpublished,

some published but not readily accessible [from past meetings of The International Union for the Scientific Study of Population and its research committees, or from other small conferences and seminars]. Rejecting the idea that demography is simply a branch of applied statistics, his work views it as an autonomous and complete scientific discipline. When viewed from the perspective of modern philosophy of science, specifically the semantic or model-based school, demography is a balanced discipline, with a rich body of techniques and data, but also with more and better theories than generally recognized. As demonstrated in this book, some demographic techniques can also be seen as theoretical models, and some substantive/behavioral models, commonly rejected as theory because of inconsistent observations, are now seen as valuable theoretical models, for example demographic transition theory. This book shows how demography can build a strong theoretical edifice on its broad and deep empirical foundation by adoption of the model-based approach to science. But the full-fruits of this approach will require demographers to make greater use of computer modeling [both macro- and micro-simulation], in the statement and manipulation of theoretical ideas, as well as for numerical computation. This book is open access under a CC BY license.

Practical Model-based Systems Engineering Aug 30 2022 This comprehensive resource provides systems engineers and practitioners with the analytic, design and modeling tools of the Model Based Systems Engineering (MBSE) methodology of Integrated Systems Engineering (ISE) and Pipelines of Processes in Object Oriented Architectures (PPOOA) methodology. This methodology integrates model based systems and software engineering approaches for the development of complex products, including aerospace, robotics and energy.

Model-Based Reinforcement Learning Sep 06 2020 Explore a comprehensive and practical approach to reinforcement learning Reinforcement learning is an essential paradigm of machine learning, wherein an intelligent agent performs actions that ensure optimal behavior from devices. While this paradigm of machine learning has gained tremendous success and popularity in recent years, previous scholarship has focused either on theory—optimal control and dynamic programming – or on algorithms—most of which are simulation-based. Model-Based Reinforcement Learning provides a model-based framework to bridge these two aspects, thereby creating a holistic treatment of the topic of model-based online learning control. In doing so, the authors seek to develop a model-based framework for data-driven control that bridges the topics of systems identification from data, model-based reinforcement learning, and optimal control, as well as the applications of each. This new technique for assessing classical results will allow for a more efficient reinforcement learning system. At its heart, this book is focused on providing an end-to-end framework—from design to application—of a more tractable model-based reinforcement learning technique. Model-Based Reinforcement Learning readers will also find: A useful textbook to use in graduate courses on

data-driven and learning-based control that emphasizes modeling and control of dynamical systems from data Detailed comparisons of the impact of different techniques, such as basic linear quadratic controller, learning-based model predictive control, model-free reinforcement learning, and structured online learning Applications and case studies on ground vehicles with nonholonomic dynamics and another on quadrator helicopters An online, Python-based toolbox that accompanies the contents covered in the book, as well as the necessary code and data Model-Based Reinforcement Learning is a useful reference for senior undergraduate students, graduate students, research assistants, professors, process control engineers, and roboticists.

Practical Model-Based Testing Jun 15 2021 Practical Model-Based Testing gives a practical introduction to model-based testing, showing how to write models for testing purposes and how to use model-based testing tools to generate test suites. It is aimed at testers and software developers who wish to use model-based testing, rather than at tool-developers or academics. The book focuses on the mainstream practice of functional black-box testing and covers different styles of models, especially transition-based models (UML state machines) and pre/post models (UML/OCL specifications and B notation). The steps of applying model-based testing are demonstrated on examples and case studies from a variety of software domains, including embedded software and information systems. From this book you will learn: The basic principles and terminology of model-based testing How model-based testing differs from other testing processes How model-based testing fits into typical software lifecycles such as agile methods and the Unified Process The benefits and limitations of model-based testing, its cost effectiveness and how it can reduce time-to-market A step-by-step process for applying model-based testing How to write good models for model-based testing How to use a variety of test selection criteria to control the tests that are generated from your models How model-based testing can connect to existing automated test execution platforms such as Mercury Test Director, Java JUnit, and proprietary test execution environments Presents the basic principles and terminology of model-based testing Shows how model-based testing fits into the software lifecycle, its cost-effectiveness, and how it can reduce time to market Offers guidance on how to use different kinds of modeling techniques, useful test generation strategies, how to apply model-based testing techniques to real applications using case studies

Model-Based Evaluation of Antimicrobial Agents in Children Apr 13 2021 Topic Editor Johannes N. van den Anker is the Chief Medical Officer at Reveragen Biopharma, as well as holding his positions at academic institutions. The other Topic Editor declares no competing interests with regard to the Research Topic subject.

Optimal Experimental Design for Chemical Engineers Mar 25 2022 Mechanistic mathematical models are an essential tool for the study, simulation and optimisation of processes in chemical engineering, allowing for a quantitative description of observed

phenomena through the definition of laws and correlations. Development of these models are often costly and time-consuming, whilst the validation and statistical assessment of the model structure, and the precise estimation of model parameters, may require extensive experimentation. In response, model building procedures have been proposed for developing, improving and validating mechanistic models in more efficient ways by managing and guiding the information obtained from experimental activities. These procedures heavily rely on the use of efficient computational techniques for model identification based on the use of optimal design of experiments techniques. This book guides the reader through statistical tools and methods for building mechanistic mathematical models in chemical engineering using design of experiment techniques. Relevant chemical engineering case studies are used throughout the book to provide a practical approach to this complex topic. Ideal for experimenters, who will find useful tips for driving experiments, and modellers who will find useful information on model development, selection and validation, this book is essential for chemical engineers across academia and industry. ment techniques. Relevant chemical engineering case studies are used throughout the book to provide a practical approach to this complex topic. Ideal for experimenters, who will find useful tips for driving experiments, and modellers who will find useful information on model development, selection and validation, this book is essential for chemical engineers across academia and industry.

Quantitative Systems Pharmacology Jul 05 2020 Quantitative Systems Pharmacology: Models and Model-Based Systems with Applications, Volume 42, provides a quantitative approach to problem-solving that is targeted to engineers. The book gathers the contributions of doctors, pharmacists, biologists, and chemists who give key information on the elements needed to model a complex machine like the human body. It presents information on diagnoses, administration and release of therapeutics, distribution metabolism and excretion of drugs, compartmental pharmacokinetics, physiologically-based pharmacokinetics, pharmacodynamics, identifiability of models, numerical methods for models identification, design of experiments, in vitro and in vivo models, and more. As the pharma community is progressively acknowledging that a quantitative and systematic approach to drug administration, release, pharmacokinetics and pharmacodynamics is highly recommended to understand the mechanisms and effects of drugs, this book is a timely resource. Outlines a model-based approach (based on Process Systems Engineering-OSE and Computer Aided Process Engineering-CAPE) in quantitative pharmacology Explains how therapeutics work in the human body and how anatomy and physiology influences drug efficacy Discusses how drugs are driven to specific targets using nanoparticles Offers insight into how in vitro and in vivo experiments help understand the drug mechanism of action and optimize their performance Includes case studies showing the positive outcome of these methods in personalized therapies, therapeutic drug monitoring, clinical trials analysis and drug formulation

How to Engineer Software Jul 29 2022 A guide to the application of the theory and practice of computing to develop and maintain software that economically solves real-world problem How to Engineer Software is a practical, how-to guide that explores the concepts and techniques of model-based software engineering using the Unified Modeling Language. The author—a noted expert on the topic—demonstrates how software can be developed and maintained under a true engineering discipline. He describes the relevant software engineering practices that are grounded in Computer Science and Discrete Mathematics. Model-based software engineering uses semantic modeling to reveal as many precise requirements as possible. This approach separates business complexities from technology complexities, and gives developers the most freedom in finding optimal designs and code. The book promotes development scalability through domain partitioning and subdomain partitioning. It also explores software documentation that specifically and intentionally adds value for development and maintenance. This important book: Contains many illustrative examples of model-based software engineering, from semantic model all the way to executable code Explains how to derive verification (acceptance) test cases from a semantic model Describes project estimation, along with alternative software development and maintenance processes Shows how to develop and maintain cost-effective software that solves real-world problems Written for graduate and undergraduate students in software engineering and professionals in the field, How to Engineer Software offers an introduction to applying the theory of computing with practice and judgment in order to economically develop and maintain software.

Model-based Fault Diagnosis in Dynamic Systems Using Identification Techniques Mar 01 2020 Safety in industrial process and production plants is a concern of rising importance but because the control devices which are now exploited to improve the performance of industrial processes include both sophisticated digital system design techniques and complex hardware, there is a higher probability of failure. Control systems must include automatic supervision of closed-loop operation to detect and isolate malfunctions quickly. A promising method for solving this problem is "analytical redundancy", in which residual signals are obtained and an accurate model of the system mimics real process behaviour. If a fault occurs, the residual signal is used to diagnose and isolate the malfunction. This book focuses on model identification oriented to the analytical approach of fault diagnosis and identification covering: choice of model structure; parameter identification; residual generation; and fault diagnosis and isolation. Sample case studies are used to demonstrate the application of these techniques.

Model-Based Approaches to Learning May 15 2021 Model-Based Approaches to Learning provides a new perspective called learning by system modeling. This book explores the learning impact of students when constructing models of complex systems.

Model-Based Engineering of Embedded Systems Mar 13 2021 Embedded systems have long become essential in application areas in which human control is impossible or infeasible. The development of modern embedded systems is becoming increasingly difficult and challenging because of their overall system complexity, their tighter and cross-functional integration, the increasing requirements concerning safety and real-time behavior, and the need to reduce development and operation costs. This book provides a comprehensive overview of the Software Platform Embedded Systems (SPES) modeling framework and demonstrates its applicability in embedded system development in various industry domains such as automation, automotive, avionics, energy, and healthcare. In SPES 2020, twenty-one partners from academia and industry have joined forces in order to develop and evaluate in different industrial domains a modeling framework that reflects the current state of the art in embedded systems engineering. The content of this book is structured in four parts. Part I "Starting Point" discusses the status quo of embedded systems development and model-based engineering, and summarizes the key requirements faced when developing embedded systems in different application domains. Part II "The SPES Modeling Framework" describes the SPES modeling framework. Part III "Application and Evaluation of the SPES Modeling Framework" reports on the validation steps taken to ensure that the framework met the requirements discussed in Part I. Finally, Part IV "Impact of the SPES Modeling Framework" summarizes the results achieved and provides an outlook on future work. The book is mainly aimed at professionals and practitioners who deal with the development of embedded systems on a daily basis. Researchers in academia and industry may use it as a compendium for the requirements and state-of-the-art solution concepts for embedded systems development.

Model-Based Tools for Pharmaceutical Manufacturing Processes Nov 08 2020 The Special Issue on "Model-Based Tools for Pharmaceutical Manufacturing Processes" will curate novel advances in the development and application of model-based tools to address ever-present challenges of the traditional pharmaceutical manufacturing practice as well as new trends. This book provides a collection of nine papers on original advances in the model-based process unit, system-level, quality-by-design under uncertainty, and decision-making applications of pharmaceutical manufacturing processes.

Model-Based Design and Evaluation of Interactive Applications Jun 27 2022 This book covers methods for user interface design and evaluation. It shows how the systematic use of task models can make the design and development of interactive software applications easier and more effective, and how it can lead to improved usability. Useful examples of how to apply the methods will be of interest to application developers. A website containing additional exercises and pointers to relevant freeware will also be available.

Model-Based Testing Essentials - Guide to the ISTQB Certified Model-Based Tester Dec 10 2020 Provides a practical and comprehensive introduction to the key aspects of model-based testing as taught in the ISTQB® Model-Based Tester—Foundation Level

Certification Syllabus This book covers the essentials of Model-Based Testing (MBT) needed to pass the ISTQB® Foundation Level Model-Based Tester Certification. The text begins with an introduction to MBT, covering both the benefits and the limitations of MBT. The authors review the various approaches to model-based testing, explaining the fundamental processes in MBT, the different modeling languages used, common good modeling practices, and the typical mistakes and pitfalls. The book explains the specifics of MBT test implementation, the dependencies on modeling and test generation activities, and the steps required to automate the generated test cases. The text discusses the introduction of MBT in a company, presenting metrics to measure success and good practices to apply. Provides case studies illustrating different approaches to Model-Based Testing Includes in-text exercises to encourage readers to practice modeling and test generation activities Contains appendices with solutions to the in-text exercises, a short quiz to test readers, along with additional information Model-Based Testing Essentials – Guide to the ISTQB® Certified Model-Based Tester – Foundation Level is written primarily for participants of the ISTQB® Certification: software engineers, test engineers, software developers, and anybody else involved in software quality assurance. This book can also be used for anyone who wants a deeper understanding of software testing and of the use of models for test generation.

An Introduction to Model-Based Survey Sampling with Applications Aug 18 2021 This text brings together important ideas on the model-based approach to sample survey, which has been developed over the last twenty years. Suitable for graduate students and professional statisticians, it moves from basic ideas fundamental to sampling to more rigorous mathematical modelling and data analysis and includes exercises and solutions.

Agile Model-Based Development Using UML-RSDS Apr 25 2022 This book describes the concepts and application of model-based development (MBD), model transformations, and Agile MBD to a wide range of software systems. It covers systems requirements engineering, system specification and design, verification, reuse, and system composition in the context of Agile MBD. Examples of applications in finance, system migration, internet systems and software refactoring are given. An established open-source MBD technology, UML-RSDS, is used throughout to illustrate the concepts. The book is suitable for industrial practitioners who need training in Agile MBD, and those who need to understand the issues to be considered when introducing MBD in an industrial context. It is also suitable for academic researchers, and for use as text for undergraduate or postgraduate courses in MBD. Examples for educational use of UML-RSDS are included in the book.

Republic of Mozambique: Technical Assistance Report-Inflation Targeting and Model-based Monetary Policy Analysis Jan 23 2022 The purpose of the mission was to improve the understanding of the conduct of monetary policy in an inflation targeting (IT) central bank. During the September visit, the mission provided capacity building through daily

morning seminars, giving an introduction to modern theory of monetary policy in small-open economies, and by performing monetary policy analyses based on BM's quarterly projection model (QPM) in the afternoons.

Quality-driven Reuse of Model-based Software Architecture Elements Oct 08 2020
Conceptual Model-Based Problem Solving Aug 25 2019 Are you having trouble in finding Tier II intervention materials for elementary students who are struggling in math? Are you hungry for effective instructional strategies that will address students' conceptual gap in additive and multiplicative math problem solving? Are you searching for a powerful and generalizable problem solving approach that will help those who are left behind in meeting the Common Core State Standards for Mathematics (CCSSM)? If so, this book is the answer for you. • The conceptual model-based problem solving (COMPS) program emphasizes mathematical modeling and algebraic representation of mathematical relations in equations, which are in line with the new Common Core. • "Through building most fundamental concepts pertinent to additive and multiplicative reasoning and making the connection between concrete and abstract modeling, students were prepared to go above and beyond concrete level of operation and be able to use mathematical models to solve more complex real-world problems. As the connection is made between the concrete model (or students' existing knowledge scheme) and the symbolic mathematical algorithm, the abstract mathematical models are no longer "alien" to the students." As Ms. Karen Combs, Director of Elementary Education of Lafayette School Corporation in Indiana, testified: "It really worked with our kids!" • "One hallmark of mathematical understanding is the ability to justify,... why a particular mathematical statement is true or where a mathematical rule comes from" (http://illustrativemathematics.org/standards). Through making connections between mathematical ideas, the COMPS program makes explicit the reasoning behind math, which has the potential to promote a powerful transfer of knowledge by applying the learned conception to solve other problems in new contexts. • Dr. Yan Ping Xin's book contains essential tools for teachers to help students with learning disabilities or difficulties close the gap in mathematics word problem solving. I have witnessed many struggling students use these strategies to solve word problems and gain confidence as learners of mathematics. This book is a valuable resource for general and special education teachers of mathematics. - Casey Hord, PhD, University of Cincinnati
Simulation and Model-Based Methodologies: An Integrative View Feb 21 2022 NATO Advanced Institute Ottawa, Ontario/ Canada, July 26 - August 6, 1982
Model-based Systems Architecting Sep 26 2019 Model-based Systems Architecting is a key tool for designing complex industrial systems. It is dedicated to the working systems architects, engineers and modelers, in order to help them master the complex integrated systems that they are dealing with in their day-to-day professional lives. It presents the CESAMES Systems Architecting Method (CESAM), a systems architecting and modeling

framework which has been developed since 2003 in close interaction with many leading industrial companies, providing rigorous and unambiguous semantics for all classical systems architecture concepts. This approach is practically robust and easy-to-use: during the last decade, it was deployed in more than 2,000 real system development projects within the industry, and distributed to around 10,000 engineers around the globe.
Formal Methods Jun 23 2019 Although formal analysis programming techniques may be quiteold, the introduction of formal methods only dates from the 1980s.These techniques enable us to analyze the behavior of a softwareapplication, described in a programming language. It took until theend of the 1990s before formal methods or the B method could beimplemented in industrial applications or be usable in anindustrial setting. Current literature only gives students and researchers very generaloverviews of formal methods. The purpose of this book is to presentfeedback from experience on the use of "formal methods"(such as proof and model-checking) in industrial examples withinthe transportation domain. This book is based on the experience of people who are currentlyinvolved in the creation and evaluation of safety critical systemssoftware. The involvement of people from within the industry allowsus to avoid the usual problems of confidentiality which could ariseand thus enables us to supply new useful information (photos,architecture plans, real examples, etc.). Topics covered by the chapters of this book include SAET-METEOR,the B method and B tools, model-based design using Simulink, theSimulink design verifier proof tool, the implementation andapplications of SCADE (Safety Critical Application DevelopmentEnvironment), GATeL: A V&V Platform for SCADE models andControlBuild. Contents 1. From Classic Languages to Formal Methods, Jean-LouisBoulanger. 2. Formal Method in the Railway Sector & the First ComplexApplication: SAET-METEOR, Jean-Louis Boulanger. 3. The B Method and B Tools, Jean-Louis Boulanger. 4. Model-Based Design Using Simulink – Modeling, CodeGeneration, Verification, and Validation, Mirko Conrad and PieterJ. Mosterman. 5. Proving Global Properties with the Aid of the SIMULINK DESIGNVERIFIER Proof Tool, Véronique Delebarre andJean-Frédéric Etienne. 6. SCADE: Implementation and Applications, Jean-Louis Camus. 7. GATeL: A V&V Platform for SCADE Models, Bruno Marre,Benjamin Bianc, Patricia Mouy and Christophe Junke. 8. ControlBuild, a Development Framework & for ControlEngineering, Franck Corbier. 9. Conclusion, Jean-Louis Boulanger.
Model-based System Management for Multi-tiered Servers Aug 06 2020
Model-Based Reasoning Dec 22 2021 There are several key ingredients common to the various forms of model-based reasoning considered in this book. The term 'model' comprises both internal and external representations. The models are intended as interpretations of target physical systems, processes, phenomena, or situations and are retrieved or constructed on the basis of potentially satisfying salient constraints of the target domain. The book's contributors are researchers active in the area

of creative reasoning in science and technology.
Model-Based Design for Embedded Systems Sep 30 2022 The demands of increasingly complex embedded systems and associated performance computations have resulted in the development of heterogeneous computing architectures that often integrate several types of processors, analog and digital electronic components, and mechanical and optical components¿all on a single chip. As a result, now the most prominent challenge for the design automation community is to efficiently plan for such heterogeneity and to fully exploit its capabilities. A compilation of work from internationally renowned authors, Model-Based Design for Embedded Systems elaborates on related practices and addresses the main facets of heterogeneous model-based design for embedded systems, including the current state of the art, important challenges, and the latest trends. Focusing on computational models as the core design artifact, this book presents the cutting-edge results that have helped establish model-based design and continue to expand its parameters. The book is organized into three sections: Real-Time and Performance Analysis in Heterogeneous Embedded Systems, Design Tools and Methodology for Multiprocessor System-on-Chip, and Design Tools and Methodology for Multidomain Embedded Systems. The respective contributors share their considerable expertise on the automation of design refinement and how to relate properties throughout this refinement while enabling analytic and synthetic qualities. They focus on multi-core methodological issues, real-time analysis, and modeling and validation, taking into account how optical, electronic, and mechanical components often interface. Model-based design is emerging as a solution to bridge the gap between the availability of computational capabilities and our inability to make full use of them yet. This approach enables teams to start the design process using a high-level model that is gradually refined through abstraction levels to ultimately yield a prototype. When executed well, model-based design encourages enhanced performance and quicker time to market for a product. Illustrating a broad and diverse spectrum of applications such as in the automotive aerospace, health care, consumer electronics, this volume provides designers with practical, readily adaptable modeling solutions for their own practice.
Signal Processing Dec 30 2019
Autonomous, Model-Based Diagnosis Agents Jul 17 2021 Autonomous, Model-Based Diagnosis Agents defines and describes the implementation of an architecture for autonomous, model-based diagnosis agents. It does this by developing a logic programming approach for model-based diagnosis and introducing strategies to deal with more complex diagnosis problems, and then embedding the diagnosis framework into the agent architecture of vivid agents. Autonomous, Model-Based Diagnosis Agents surveys extended logic programming and shows how this expressive language is used to model diagnosis problems stemming from applications such as digital circuits, traffic control, integrity checking of a chemical database, alarm-correlation in cellular phone networks, diagnosis of an automatic mirror furnace, and

diagnosis of communication protocols. The book reviews a bottom-up algorithm to remove contradiction from extended logic programs and substantially improves it by top-down evaluation of extended logic programs. Both algorithms are evaluated in the circuit domain including some of the ISCAS85 benchmark circuits. This comprehensive in-depth study of concepts, architectures, and implementation of autonomous, model-based diagnosis agents will be of great value for researchers, engineers, and graduate students with a background in artificial intelligence. For practitioners, it provides three main contributions: first, it provides many examples from diverse areas such as alarm correlation in phone networks to inconsistency checking in databases; second, it describes an architecture to develop agents; and third, it describes a sophisticated and declarative implementation of the concepts and architectures introduced.

Model-Based Safety and Assessment May 03 2020 This book constitutes the proceedings of the 6th International Symposium on Model-Based Safety and Assessment, IMBSA 2019, held inThessaloniki, Greece, in October 2019. The 24 revised full papers presented were carefully reviewed and selected from 46 initial submissions. The papers are organized in topical sections on safety models and languages; dependability analysis process; safety assessment; safety assessment in automotive industry; AI in safety assessment.

Robust Integration of Model-Based Fault Estimation and Fault-Tolerant Control Apr 01 2020 Robust Integration of Model-Based Fault Estimation and Fault-Tolerant Control is a systematic examination of methods used to overcome the inevitable system uncertainties arising when a fault estimation (FE) function and a fault-tolerant controller interact as they are employed together to compensate for system faults and maintain robustly acceptable system performance. It covers the important subject of robust integration of FE and FTC with the aim of guaranteeing closed-loop stability. The reader's understanding of the theory is supported by the extensive use of tutorial examples, including some MATLAB®-based material available from the Springer website and by industrial-applications-based material. The text is structured into three parts: Part I examines the basic concepts of FE and FTC, providing extensive insight into the importance of and challenges involved in their integration; Part II describes five effective strategies for the integration of FE and FTC: sequential, iterative, simultaneous, adaptive-decoupling, and robust decoupling; and Part III begins to extend the proposed strategies to nonlinear and large-scale systems and covers their application in the fields of renewable energy, robotics and networked systems. The strategies presented are applicable to a broad range of control problems, because in the absence of faults the FE-based FTC naturally reverts to conventional observer-based control. The book is a useful resource for researchers and engineers working in the area of fault-tolerant control systems, and supplementary material for a graduate- or postgraduate-level course on fault diagnosis and FTC. Advances in Industrial Control reports and encourages the transfer of technology in control engineering. The rapid development of control technology

has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control. Model-Based Systems Engineering with Object-Process Methodology and SysML Oct 27 2019 Exploring The Web presents a unique, comprehensible treatment of the Web, from its foundations to cutting-edge technologies and applications. The work goes beyond major web developments by demonstrating how the Semantic Web facilitates joint interaction between human beings and machines. In a systematic exposition, the book examines the principles underlying web design, the technologies that support its operations, and a host of web applications. The material covers web fundamentals and XML, Web Services, the Semantic Web, and an array of applications. This work targets researchers and professionals working in web areas that affect software engineering, systems architecture, analysis and design methods, and modeling and simulation, making the book relevant to developers of various domains. It is also designed for advanced undergraduates and graduates in courses such as Web Services, Web technologies, Semantic Web, Analysis and Design of Web-based Systems, and Modeling Web Applications.

Model-Based Safety and Assessment Jun 03 2020 This book constitutes the proceedings of the 7th International Symposium on Model-Based Safety and Assessment, IMBSA 2020, held in Lisbon, Portugal, in September 2020. The conference was held virtually due to the COVID-19 pandemic. The 15 revised full papers and 4 short papers presented were carefully reviewed and selected from 30 initial submissions. The papers are organized in topical sections on safety models and languages; state-space modeling; dependability analysis process; safety assessment in automotive domain; AI and safety assurance.

Model-Based Systems Engineering with OPM and SysML May 27 2022 Model-Based Systems Engineering (MBSE), which tackles architecting and design of complex systems through the use of formal models, is emerging as the most critical component of systems engineering. This textbook specifies the two leading conceptual modeling languages, OPM—the new ISO 19450, composed primarily by the author of this book, and OMG SysML. It provides essential insights into a domain-independent, discipline-crossing methodology of developing or researching complex systems of any conceivable kind and size. Combining theory with a host of industrial, biological, and daily life examples, the book explains principles and provides guidelines for architecting complex, multidisciplinary systems, making it an indispensable resource for systems architects and designers, engineers of any discipline, executives at all levels, project managers, IT professional, systems scientists, and engineering students.

Software Quality. Model-Based Approaches for Advanced Software and Systems Engineering Jan 29 2020 This book constitutes the refereed proceedings of the 6th Software Quality Days Conference (SWQD) held in Vienna, Austria, in January 2014. This professional symposium and conference offers a range of comprehensive and valuable opportunities for advanced

professional training, new ideas and networking with a series of keynote speeches, professional lectures, exhibits and tutorials. The four scientific full papers accepted for SWQD were each peer reviewed by three or more reviewers and selected out of 24 high-quality submissions. Further, one keynote and ten short papers on promising research directions were also presented and included in order to spark discussions between researchers and practitioners. The papers are organized into topical sections on software process improvement and measurement, requirements management, value-based software engineering, software and systems testing, automation-supported testing and quality assurance and collaboration.

Model-Based Software Performance Analysis Feb 09 2021 Poor performance is one of the main quality-related shortcomings that cause software projects to fail. Thus, the need to address performance concerns early during the software development process is fully acknowledged, and there is a growing interest in the research and software industry communities towards techniques, methods and tools that permit to manage system performance concerns as an integral part of software engineering. Model-based software performance analysis introduces performance concerns in the scope of software modeling, thus allowing the developer to carry on performance analysis throughout the software lifecycle. With this book, Cortellessa, Di Marco and Inverardi provide the cross-knowledge that allows developers to tackle software performance issues from the very early phases of software development. They explain the basic concepts of performance analysis and describe the most representative methodologies used to annotate and transform software models into performance models. To this end, they go all the way from performance primers through software and performance modeling notations to the latest transformation-based methodologies. As a result, their book is a self-contained reference text on software performance engineering, from which different target groups will benefit: professional software engineers and graduate students in software engineering will learn both basic concepts of performance modeling and new methodologies; while performance specialists will find out how to investigate software performance model building.

eWork and eBusiness in Architecture, Engineering and Construction Jul 25 2019 Biannually since 1994, the European Conference on Product and Process Modelling in the Building and Construction Industry has provided a review of research, given valuable future work outlooks, and provided a communication platform for future co-operative research and development at both European and global levels.This volume, of special interest t

Model-Based Testing for Embedded Systems Nov 28 2019 What the experts have to say about Model-Based Testing for Embedded Systems: "This book is exactly what is needed at the exact right time in this fast-growing area. From its beginnings over 10 years ago of deriving tests from UML statecharts, model-based testing has matured into a topic with both breadth and depth. Testing embedded

systems is a natural application of MBT, and this book hits the nail exactly on the head. Numerous topics are presented clearly, thoroughly, and concisely in this cutting-edge book. The authors are world-class leading experts in this area and teach us well-used and validated techniques, along with new ideas for solving hard problems. "It is rare that a book can take recent research advances and present them in a form ready for practical use, but this book accomplishes that and more. I am anxious to recommend this in my consulting and to teach a new class to my students." —Dr. Jeff Offutt, professor of software engineering, George Mason University, Fairfax, Virginia, USA "This handbook is the best resource I am aware of on the automated testing of embedded systems. It is thorough, comprehensive, and authoritative. It covers all important technical and scientific aspects but also provides highly interesting insights into the state of practice of model-based testing for embedded systems." —Dr. Lionel C. Briand, IEEE Fellow, Simula Research Laboratory, Lysaker, Norway, and professor at the University of Oslo, Norway "As model-based testing is entering the mainstream, such a comprehensive and intelligible book is a must-read for anyone looking for more information about improved testing methods for embedded systems. Illustrated with numerous aspects of these techniques from many contributors, it gives a clear picture of what the state of the art is today." —Dr. Bruno Legeard, CTO of Smartesting, professor of Software Engineering at the University of Franche-Comté, Besançon, France, and co-author of Practical Model-Based Testing