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Adaptive Rapid Environmental Assessment System Simulation Framework CRC Press

Scientific computing has often been called the third approach to scientific discovery, emerging as a peer to experimentation and theory. Historically, the synergy between experimentation and theory has been well understood: experiments give insight into possible theories, theories inspire experiments, experiments reinforce or invalidate theories, and so on. As scientific computing has evolved to produce results that meet or exceed the quality of experimental and theoretical results, it has become indispensable. Parallel processing has been an enabling technology in scientific computing for more than 20 years. This book is the first in-depth discussion of parallel computing in 10 years; it reflects the mix of topics that mathematicians, computer scientists, and computational scientists focus on to make parallel processing effective for scientific problems. Presently, the impact of parallel processing on scientific computing varies greatly across disciplines, but it plays a vital role in most problem domains and is absolutely essential in many of them. Parallel Processing for Scientific Computing is divided into four parts: The first concerns performance modeling, analysis, and optimization; the second focuses on parallel algorithms and software for an array of problems common to many modeling and simulation applications; the third emphasizes tools and environments that can ease and enhance the process of application development; and the fourth provides a sampling of applications that require parallel computing for scaling to solve larger and realistic models that can advance science and engineering. This edited volume serves as an up-to-date reference for researchers and application developers on the state of the art in scientific computing. It also serves as an excellent overview and introduction, especially for graduate and senior-level undergraduate students interested in computational modeling and simulation and related computer science and applied mathematics aspects. Contents List of Figures; List of Tables; Preface; Chapter 1: Frontiers of Scientific Computing: An Overview; Part I: Performance Modeling, Analysis and Optimization. Chapter 2: Performance Analysis: From Art to Science; Chapter 3: Approaches to Architecture-Aware Parallel Scientific Computation; Chapter 4: Achieving High Performance on the BlueGene/L Supercomputer; Chapter 5: Performance Evaluation and Modeling of Ultra-Scale Systems; Part II: Parallel Algorithms and Enabling Technologies. Chapter 6: Partitioning and Load Balancing; Chapter 7: Combinatorial Parallel and Scientific Computing; Chapter 8: Parallel Adaptive Mesh Refinement; Chapter 9: Parallel Sparse Solvers, Preconditioners, and Their Applications; Chapter 10: A Survey of Parallelization Techniques for Multigrid Solvers; Chapter 11: Fault Tolerance in Large-Scale Scientific Computing; Part III: Tools and Frameworks for Parallel Applications. Chapter 12: Parallel Tools and Environments: A Survey; Chapter 13: Parallel Linear Algebra Software; Chapter 14: High-Performance Component Software Systems; Chapter 15: Integrating Component-Based Scientific Computing Software; Part IV: Applications of Parallel Computing. Chapter 16: Parallel Algorithms for PDE-Constrained Optimization; Chapter 17: Massively Parallel Mixed-Integer Programming; Chapter 18: Parallel Methods and Software for Multicomponent Simulations; Chapter 19: Parallel Computational Biology; Chapter 20: Opportunities and Challenges for Parallel Computing in Science and Engineering; Index.

Scientific and Technical Aerospace Reports Springer Science & Business Media

This volume contains eighteen selected papers presented at the Second International Conference on Stochastic Structural Dynamics, which are related to new practical applications in the field. This and a companion volume, related to new theoretical developments, constitute the proceedings of the conference, and reflect the state of the art of the rapidly developing subject. The conference was held in Boca Raton, Florida during May 9-11, 1990 hosted by the Center for Applied Stochastic Research of Florida Atlantic University. A total of 20 technical sessions were organized, and attended by eighty participants from 12 countries. Special emphases of the conference were placed on two areas: applications to earthquake engineering and stochastic stability of nonlinear

systems. Two sessions were dedicated to the memory of late Professor Frank Kozin, one of the founders and most active contributors to the stochastic stability theory. We are indebted to the National Center for Earthquake Engineering Research (NCEER) for financial support. Most credit belongs to each of the authors whose contributions were the very basis for the undoubted success of the conference. We are grateful to the reviewers who carefully refereed the contributions for these two volumes. Our special thanks are due to Mrs. Christine Mikulski, who carried out all the necessary secretarial tasks associated with the conference with dedication.

The Challenges of Dam Removal and River Restoration John Wiley & Sons

Abstract: Prepared by the Committee on Adaptation to a Changing Climate of ASCE Civil infrastructure systems traditionally have been designed for appropriate functionality, durability, and safety for climate and weather extremes during their full-service lives; however, climate scientists inform us that the extremes of climate and weather have altered from historical values in ways difficult to predict or project. Climate-Resilient Infrastructure: Adaptive Design and Risk Management, MOP 140, provides guidance for and contributes to the developing or enhancing of methods for infrastructure analysis and design in a world in which risk profiles are changing and can be projected with varying degrees of uncertainty requiring a new design philosophy to meet this challenge. The underlying approaches in this manual of practice (MOP) are based on probabilistic methods for quantitative risk analysis, and the design framework provided focuses on identifying and analyzing low-regret, adaptive strategies to make a project more resilient. Beginning with an overview of the driving forces and hazards associated with a changing climate, subsequent chapters in MOP 140 provide observational methods, illustrative examples, and case studies; estimation of extreme events particularly related to precipitation with guidance on monitoring and measuring methods; flood design criteria and the development of project design flood elevations; computational methods of determining flood loads; adaptive design and adaptive risk management in the context of life-cycle engineering and economics; and climate resilience technologies. MOP 140 will be of interest to engineers, researchers, planners, and other stakeholders charged with adaptive design decisions to achieve infrastructure resilience targets while minimizing life-cycle costs in a changing climate

Proceedings Springer Science & Business Media

Effective measurement of the composition and properties of petroleum is essential for its exploration, production, and refining; however, new technologies and methodologies are not adequately documented in much of the current literature. Analytical Methods in Petroleum Upstream Applications explores advances in the analytical methods and instrumentation that allow more accurate determination of the components, classes of compounds, properties, and features of petroleum and its fractions. Recognized experts explore a host of topics, including: A petroleum molecular composition continuity model as a context for other analytical measurements A modern modular sampling system for use in the lab or the process area to collect and control samples for subsequent analysis The importance of oil-in-water measurements and monitoring The chemical and physical properties of heavy oils, their fractions, and products from their upgrading Analytical measurements using gas chromatography and nuclear magnetic resonance (NMR) applications Asphaltene and heavy ends analysis Chemometrics and modeling approaches for understanding petroleum composition and properties to improve upstream, midstream, and downstream operations Due to the renaissance of gas and oil production in North America, interest has grown in analytical methods for a wide range of applications. The understanding provided in this text is designed to help chemists, geologists, and chemical and petroleum engineers make more accurate estimates of the crude value to specific refinery configurations, providing insight into optimum development and extraction schemes.

Guide to Traffic Engineering Practice Artech House Publishers

Discover a simple, direct approach that highlights the basics you need within A FIRST COURSE IN THE FINITE ELEMENT METHOD, 6E. This unique book is written so both undergraduate and graduate readers can easily comprehend the content without the usual prerequisites, such as structural analysis. The book is written primarily as a basic learning tool for those

studying civil and mechanical engineering who are primarily interested in stress analysis and heat transfer. The text offers ideal preparation for utilizing the finite element method as a tool to solve practical physical problems. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

NASA Tech Briefs Springer Science & Business Media

The latest update to Bela Liptak's acclaimed "bible" of instrument engineering is now available. Retaining the format that made the previous editions bestsellers in their own right, the fourth edition of Process Control and Optimization continues the tradition of providing quick and easy access to highly practical information. The authors are practicing engineers, not theoretical people from academia, and their from-the-trenches advice has been repeatedly tested in real-life applications. Expanded coverage includes descriptions of overseas manufacturer's products and concepts, model-based optimization in control theory, new major inventions and innovations in control valves, and a full chapter devoted to safety. With more than 2000 graphs, figures, and tables, this all-inclusive encyclopedic volume replaces an entire library with one authoritative reference. The fourth edition brings the content of the previous editions completely up to date, incorporates the developments of the last decade, and broadens the horizons of the work from an American to a global perspective. Bé la G. Lipt á k speaks on Post-Oil Energy Technology on the AT&T Tech Channel.

Climate-Resilient Infrastructure CRC Press

This book provides an overview of the research related to psychological assessment across South Africa. The thirty-six chapters provide a combination of psychometric theory and practical assessment applications in order to combine the currently disparate research that has been conducted locally in this field. Existing South African texts on psychological assessment are predominantly academic textbooks that explain psychometric theory and provide brief descriptions of a few testing instruments. Psychological Assessment in South Africa provides in-depth coverage of a range of areas within the broad field of psychological assessment, including research conducted with various psychological instruments. The chapters critically interrogate the current Eurocentric and Western cultural hegemonic practices that dominate the field of psychological assessment. The book therefore has the potential to function both as an academic text for graduate students, as well as a specialist resource for professionals, including psychologists, psychometrists, remedial teachers and human resource practitioners.

Evolutionary and Adaptive Computing in Engineering Design GID, the Personal Pre-

post ProcessorClimate-Resilient InfrastructureAbstract: Prepared by the Committee on Adaptation to a Changing Climate of ASCE Civil infrastructure systems traditionally have been designed for appropriate functionality, durability, and safety for climate and weather extremes during their full-service lives; however, climate scientists inform us that the extremes of climate and weather have altered from historical values in ways difficult to predict or project. Climate-Resilient Infrastructure: Adaptive Design and Risk Management, MOP 140, provides guidance for and contributes to the developing or enhancing of methods for infrastructure analysis and design in a world in which risk profiles are changing and can be projected with varying degrees of uncertainty requiring a new design philosophy to meet this challenge. The underlying approaches in this manual of practice (MOP) are based on probabilistic methods for quantitative risk analysis, and the design framework provided focuses on identifying and analyzing low-regret, adaptive strategies to make a project more resilient. Beginning with an overview of the driving forces and hazards associated with a changing climate, subsequent chapters in MOP 140 provide observational methods, illustrative examples, and case studies; estimation of extreme events particularly related to precipitation with guidance on monitoring and measuring methods; flood design

criteria and the development of project design flood elevations; computational methods of determining flood loads; adaptive design and adaptive risk management in the context of life-cycle engineering and economics; and climate resilience technologies. MOP 140 will be of interest to engineers, researchers, planners, and other stakeholders charged with adaptive design decisions to achieve infrastructure resilience targets while minimizing life-cycle costs in a changing climate.

Instrument Engineers' Handbook, Volume Two
Adaptive Rapid Environmental Assessment (AREA) is a new concept for minimizing the non model-based sonar performance prediction uncertainty and improving the model-based sonar performance by adaptive and rapid in situ measurement in the ocean environment. In this thesis, a possible structure of the AREA system has been developed; an AREA System Simulation Framework has been constructed using C++ , which can simulate how AREA system will work and be utilized to determine the optimal or sub-optimal sampling strategies. A user's manual for the simulation framework, and specifications of all important C++ classes are included.

Adaptive Control Design and Analysis Springer Science & Business Media

This powerful software package reconstructs real flight situations and provides a simple and effective way of accumulating the backscattering characteristics of 11 types of aerial targets for both narrow-band and wide-band probing. These characteristics provide critical information for radar recognition, detection and tracking investigations. It utilizes the simplest component's method to quickly calculate backscattered signals at the output of amplitude and phase detectors in the X, C, S, and L bands. Also, the software allows the creation of new target models using the target editor program included. this package.

Structural Dynamics Springer

The Adaptive Computing in Design and Manufacture Conference series is now in its tenth year and has become a well-established, application-oriented meeting recognised by several UK Engineering Institutions and the International Society of Genetic and Evolutionary Computing. The main theme of the conference again relates to the integration of evolutionary and adaptive computing technologies with design and manufacturing processes whilst also taking into account complementary advanced computing technologies. Evolutionary and adaptive computing techniques continue to increase their penetration of industrial and commercial practice as their powerful search, exploration and optimisation capabilities become ever more apparent. The last two years have seen a very significant increase in the development of commercial software tools utilising adaptive computing technologies and the emergence of related commercial research and consultancy organisations supporting the introduction of best practice in terms of industrial utilisation. Adaptive Computing in Design and Manufacture V is comprised of selected papers that cover a diverse set of industrial application areas including: engineering design and design environments, manufacturing process design, scheduling and control, electronic circuit design, fault detection. Various aspects of search and optimisation such as multi-objective and constrained optimisation are also investigated in the context of integration with industrial processes. In addition to evolutionary computing techniques, both neural-net and agent-based technologies play a role in a number of contributions. This collection of papers will be of particular interest to both industrial researchers and practitioners in addition to the academic research communities of engineering, operational research and computer science.

Radar Target Backscattering Simulation CRC Press

Gain a clear understanding of the basics of the finite element method (FEM) with this simple, direct, contemporary approach in Logan's A FIRST COURSE IN THE FINITE ELEMENT METHOD, ENHANCED VERSION, 6th Edition. This unique presentation is written so you can easily comprehend content without the usual prerequisites, such as structural analysis. This book is ideal, whether you are a studying civil or mechanical engineering and are primarily interested in stress analysis and heat transfer, or you need a foundation for applying FEM as a tool in solving practical physical problems. New and expanded real-world examples and problems demonstrate FEM applications in a variety of engineering and mathematical physics-related fields. Each chapter uses a consistent structure with step-by-step, worked-out examples, ideal for beginning or advanced study. A special graphic insert further clarifies 3-D images as well as FEM concepts to prepare you for success. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Stochastic Structural Dynamics 2 CI-Engineering

"River restoration is a societal goal in the United States. This collection of research articles focuses on our current understanding of the impacts of

removing dams and the role of dam removal in the larger context of river restoration. The papers are grouped by topic: (1) assessment of existing dams, strategies to determine impounded legacy sediments, and evaluating whether or not to remove the dam; (2) case studies of the hydrologic, sediment, and ecosystem impacts of recent dam removals; (3) assessment of river restoration by modifying flows or removing dams; and (4) the concept of river restoration in the context of historical changes in river systems"--Provided by publisher.

Instrument Engineers' Handbook,(Volume 2) Third Edition AIAA

This handbook supplies analytical tools for the design and development of adaptive optics systems to enhance their ability to adjust for atmospheric turbulence, optical fabrication errors, thermally induced distortions, and laser device aberrations. It provides recommendations for selecting, testing and installing a wavefront compensation system.

Advanced Operating Systems and Kernel Applications: Techniques and Technologies IGI Global

This new edition adds several new chapters and is thoroughly updated to include data on new topics such as hydraulic fracturing, CO2 sequestration, sustainable groundwater management, and more. Providing a complete treatment of the theory and practice of groundwater engineering, this new handbook also presents a current and detailed review of how to model the flow of water and the transport of contaminants both in the unsaturated and saturated zones, covers the protection of groundwater, and the remediation of contaminated groundwater.

A Collection of Technical Papers: Structures Geological Society of America

This new version of AWAS for Windows offers you an even more powerful and faster tool for analyzing wire antennas or scatterers. Updates include: 32-bit code which runs about 4 times faster than the previous version; more nodes, segments, and unknowns for your analysis; improved graphics capabilities for displaying results, including Smith chart and polar radiation patterns; and a treatment of the real ground by Sommerfeld's formulation.

Handbook of Software Engineering Springer

A number of metrics for assessing human thermal response to climatic conditions have been proposed in scientific literature over the last decades. They aim at describing human thermal perception of the thermal environment to which an individual or a group of people is exposed. More recently, a new type of "discomfort index" has been proposed for describing, in a synthetic way, long-term phenomena. Starting from a systematic review of a number of long-term global discomfort indices, they are then contrasted and compared on a reference case study in order to identify their similarities and differences and strengths and weaknesses. Based on this analysis, a new short-term local discomfort index is proposed for the American Adaptive comfort model. Finally, a new and reliable long-term general discomfort index is presented. It is delivered in three versions and each of them is suitable to be respectively coupled with the Fanger, the European Adaptive and the American Adaptive comfort models.

The Handbook of Groundwater Engineering Cengage Learning

This handbook provides a unique and in-depth survey of the current state-of-the-art in software engineering, covering its major topics, the conceptual genealogy of each subfield, and discussing future research directions. Subjects include foundational areas of software engineering (e.g. software processes, requirements engineering, software architecture, software testing, formal methods, software maintenance) as well as emerging areas (e.g., self-adaptive systems, software engineering in the cloud, coordination technology). Each chapter includes an introduction to central concepts and principles, a guided tour of seminal papers and key contributions, and promising future research directions. The authors of the individual chapters are all acknowledged experts in their field and include many who have pioneered the techniques and technologies discussed. Readers will find an authoritative and concise review of each subject, and will also learn how software engineering technologies have evolved and are likely to develop in the years to come. This book will be especially useful for researchers who are new to software engineering, and for practitioners seeking to enhance their skills and knowledge.

Instrument Engineers' Handbook, Volume Two CRC Press

"This book discusses non-distributed operating systems that benefit researchers, academicians, and practitioners"--Provided by publisher.

Thermal Comfort Assessment of Buildings SIAM

ICIAR 2005, the International Conference on Image Analysis and Recognition, was the second ICIAR conference, and was held in Toronto, Canada. ICIAR is organized annually, and alternates between Europe and North America. ICIAR 2004 was held in Porto, Portugal. The idea of offering these conferences came as a result of discussion between researchers in Portugal and Canada to encourage collaboration and exchange, mainly between these two countries, but also with the open participation of other countries, addressing recent advances in theory, methodology and applications. The response to the call for papers for ICIAR 2005 was encouraging. From 295 full papers submitted, 153 were finally accepted (80 oral presentations, and 73 posters). The review process was carried out by the Program Committee members and other reviewers; all are experts in various image analysis and recognition areas. Each paper was reviewed by at least two reviewers, and also checked by the conference co-chairs. The high quality of the papers in these proceedings is attributed first to the authors, and second to the quality of the reviews provided by the experts. We would like to thank the authors for responding to our call, and we wholeheartedly thank the reviewers for their excellent work, and for their timely response. It is this collective effort that resulted in the strong conference program and high-quality proceedings in your hands.

A First Course in the Finite Element Method, SI Edition NYU Press

Following an introduction to the various techniques and examples of their routine application, this potential is explored through the introduction of various strategies that support searches across a far broader set of possible design solutions within time and budget constraints. Generic problem areas investigated include: - design decomposition; - whole-system design; - multi-objective and constraint satisfaction; - human-computer interaction; - computational expense. Appropriate strategies that help overcome problems often encountered when integrating computer-based techniques with complex, real-world design environments are described. A straightforward approach coupled with examples supports a rapid understanding of the manner in which such strategies can best be designed to handle the complexities of a particular problem.