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AVERY DICKSON

Evolutionary Large-Scale Multi-Objective Optimization and Applications Springer
Climbing robot is a challenging research topic that has gained much attention from researchers. Most of the robots reported in the literature are designed to climb on manmade structures, but seldom robots are designed for climbing natural environment such as trees. Trees and manmade structures are very different in nature. It brings different aspects of technical challenges to the robot design. In this book, you can find a collection of the cutting edge technologies in the field of tree-climbing robot and the ways that animals climb. It provides a valuable reference for robot designers to select appropriate climbing methods in designing tree-climbing robots for specific purposes. Based on the study, a novel bio-inspired tree-climbing robot with several breakthrough performances has been developed and presents in this book. It is capable of performing various actions that is impossible in the state-of-the-art tree-climbing robots, such as moving between

trunk and branches. This book also proposes several approaches in autonomous tree-climbing, including the sensing methodology, cognition of the environment, path planning and motion planning on both known and unknown environment.

Analog Circuits and Systems Optimization based on Evolutionary Computation Techniques Hanley & Belfus

This book introduces readers to a variety of tools for analog layout design automation. After discussing the placement and routing problem in electronic design automation (EDA), the authors overview a variety of automatic layout generation tools, as well as the most recent advances in analog layout-aware circuit sizing. The discussion includes different methods for automatic placement (a template-based Placer and an optimization-based Placer), a fully-automatic Router and an empirical-based Parasitic Extractor. The concepts and algorithms of all the modules are thoroughly described, enabling readers to reproduce the methodologies, improve the quality of their designs, or use them as starting point for a new tool. All the methods described are applied to practical examples for a 130nm design process, as well as placement and routing benchmark sets.

Tree Climbing Robot Springer Science & Business Media

Tackle the most challenging problems in science and engineering with these cutting-edge algorithms Multi-objective optimization problems (MOPs) are those in which more than one objective needs to be optimized simultaneously. As a ubiquitous component of research and engineering projects, these problems are notoriously challenging. In recent years, evolutionary algorithms (EAs) have shown significant promise in their ability to solve MOPs, but challenges remain at the level of large-scale multi-objective optimization problems (LSMOPs), where the number of variables increases and the optimized solution is correspondingly harder to reach. Evolutionary Large-Scale Multi-Objective Optimization and Applications constitutes a systematic overview of EAs and their capacity to tackle LSMOPs. It offers an introduction to both the problem class and the algorithms before delving into some of the cutting-edge algorithms which have been specifically adapted to solving LSMOPs. Deeply engaged with specific applications and alert to the latest developments in the field, it’s a must-read for students and researchers facing these famously complex but crucial optimization problems. The book’s readers will also find: Analysis of multi-optimization problems in fields such as machine learning, network science, vehicle routing, and more Discussion of benchmark problems and performance indicators for LSMOPs Presentation of a new taxonomy of algorithms in the field Evolutionary Large-Scale Multi-Objective Optimization and Applications is ideal for advanced students, researchers, and scientists and engineers facing complex optimization problems.

Exact and Representative Algorithms for Multi Objective Optimization IGI Global

Computational optimization is an important paradigm with a wide range of applications. In virtually all branches of engineering and industry, we almost always try to optimize something - whether to minimize the cost and energy consumption, or to maximize profits, outputs, performance and efficiency. In many cases, this search for optimality is challenging, either because of the high computational cost of evaluating objectives and constraints, or

because of the nonlinearity, multimodality, discontinuity and uncertainty of the problem functions in the real-world systems. Another complication is that most problems are often NP-hard, that is, the solution time for finding the optimum increases exponentially with the problem size. The development of efficient algorithms and specialized techniques that address these difficulties is of primary importance for contemporary engineering, science and industry. This book consists of 12 self-contained chapters, contributed from worldwide experts who are working in these exciting areas. The book strives to review and discuss the latest developments concerning optimization and modelling with a focus on methods and algorithms for computational optimization. It also covers well-chosen, real-world applications in science, engineering and industry. Main topics include derivative-free optimization, multi-objective evolutionary algorithms, surrogate-based methods, maximum simulated likelihood estimation, support vector machines, and metaheuristic algorithms. Application case studies include aerodynamic shape optimization, microwave engineering, black-box optimization, classification, economics, inventory optimization and structural optimization. This graduate level book can serve as an excellent reference for lecturers, researchers and students in computational science, engineering and industry.

Intelligent Optimization Springer

This book applies to the scientific area of electronic design automation (EDA) and addresses the automatic sizing of analog integrated circuits (ICs). Particularly, this book presents an approach to enhance a state-of-the-art layout-aware circuit-level optimizer (GENOM-POF), by embedding statistical knowledge from an automatically generated gradient model into the multi-objective multi-constraint optimization kernel based on the NSGA-II algorithm. The results showed allow the designer to explore the different trade-offs of the solution space, both through the achieved device sizes, or the respective layout solutions.

Macro To Nano Spectroscopy Springer

This book offers comprehensive information on the developments and applications of the solid phase microextraction (SPME) technique. The first part of the book briefly introduces readers to the fundamentals of SPME, while subsequent sections describe the applications of SPME technique in detail, including environmental analysis (air, water, soil/sediments), food analysis (volatile/nonvolatile compounds), and bioanalysis (plants, animal tissues, body fluids). The advantages and future challenges of the SPME technique are also discussed. Including recent research advances and further developments of SPME, the book offers a practical reference guide and a valuable resource for researchers and users of SPME techniques. The target audience includes analytical chemists, environmental scientists, biological scientists, material scientists, and analysts, as well as students at universities/institutes in related fields. Dr. Gangfeng Ouyang is a Professor at the School of Chemistry and Chemical Engineering, Sun Yat-sen University, China. Dr. Ruifen Jiang is an Associate Professor at the School of Environment, Jinan University, China.

Algorithms for Multi-objective Optimization of Dynamical Systems Elsevier

The special focus of this proceedings is to cover the areas of infrastructure engineering and sustainability management. The state-of-the art information in infrastructure and sustainable

issues in engineering covers earthquake, bioremediation, synergistic management, timber engineering, flood management and intelligent transport systems. It provides precise information with regards to innovative research development in construction materials and structures in addition to a compilation of interdisciplinary finding combining nano-materials and engineering.

Dictionary of Medical Acronyms and Abbreviations CRC Press

Carbon materials form pores ranging in size and morphology, from micropores of less than 1nm, to macropores of more than 50nm, and from channel-like spaces with homogenous diameters in carbon nanotubes, to round spaces in various fullerene cages, including irregularly-shaped pores in polycrystalline carbon materials. The large quantity and rapid rate of absorption of various molecules made possible by these attributes of carbon materials are now used in the storage of foreign atoms and ions for energy storage, conversion and adsorption, and for environmental remediation. Porous Carbons: Syntheses and Applications focuses on the fabrication and application of porous carbons. It considers fabrication at three scales: micropores, mesopores, and macropores. Carbon foams, sponges, and 3D-structured carbons are detailed. The title presents applications in four key areas: energy storage, energy conversion, energy adsorption, including batteries, supercapacitors, and fuel cells and environmental remediation, emphasizing the importance of pore structures at the three scales, and the diffusion and storage of various ions and molecules. The book presents a short history of each technique and material, and assesses advantages and disadvantages. This focused book provides researchers with a comprehensive understanding of both pioneering and current synthesis techniques for porous carbons, and their modern applications. Presents modern porous carbon synthesis techniques and modern applications of porous carbons Presents current research on porous carbons in energy storage, conversion and adsorption, and in environmental remediation Provides a history and assessment of both pioneering and current cutting-edge synthesis techniques and materials Covers a significant range of precursor materials, preparation techniques, and characteristics Considers the future development of porous carbons and their various potential applications

Nanoscale Devices - Fundamentals and Applications Springer Science & Business Media

Memetic Algorithms (MAs) are computational intelligence structures combining multiple and various operators in order to address optimization problems. The combination and interaction amongst operators evolves and promotes the diffusion of the most successful units and generates an algorithmic behavior which can handle complex objective functions and hard fitness landscapes. “Handbook of Memetic Algorithms” organizes, in a structured way, all the the most important results in the field of MAs since their earliest definition until now. A broad review including various algorithmic solutions as well as successful applications is included in this book. Each class of optimization problems, such as constrained optimization, multi-objective optimization, continuous vs combinatorial problems, uncertainties, are analysed separately and, for each problem, memetic recipes for tackling the difficulties are given with some successful examples. Although this book contains chapters

written by multiple authors, a great attention has been given by the editors to make it a compact and smooth work which covers all the main areas of computational intelligence optimization. It is not only a necessary read for researchers working in the research area, but also a useful handbook for practitioners and engineers who need to address real-world optimization problems. In addition, the book structure makes it an interesting work also for graduate students and researchers is related fields of mathematics and computer science.

Biomass Sugars for Non-Fuel Applications John Wiley & Sons
The application of sophisticated evolutionary computing approaches for solving complex problems with multiple conflicting objectives in science and engineering have increased steadily in the recent years. Within this growing trend, Memetic algorithms are, perhaps, one of the most successful stories, having demonstrated better efficacy in dealing with multi-objective problems as compared to its conventional counterparts. Nonetheless, researchers are only beginning to realize the vast potential of multi-objective Memetic algorithm and there remain many open topics in its design. This book presents a very first comprehensive collection of works, written by leading researchers in the field, and reflects the current state-of-the-art in the theory and practice of multi-objective Memetic algorithms. "Multi-Objective Memetic algorithms" is organized for a wide readership and will be a valuable reference for engineers, researchers, senior undergraduates and graduate students who are interested in the areas of Memetic algorithms and multi-objective optimization.

Multi-Objective Optimization in Computational Intelligence: Theory and Practice Springer
This is a multidisciplinary textbook on social commerce by leading authors of e-commerce and e-marketing textbooks, with contributions by several industry experts. It is effectively the first true textbook on this topic and can be used in one of the following ways: Textbook for a standalone elective course at the undergraduate or graduate levels (including MBA and executive MBA programs) Supplementary text in marketing, management or Information Systems disciplines Training courses in industry Support resources for researchers and practitioners in the fields of marketing, management and information management The book examines the latest trends in e-commerce, including social businesses, social networking, social collaboration, innovations and mobility. Individual chapters cover tools and platforms for social commerce; supporting theories and concepts; marketing communications; customer engagement and metrics; social shopping; social customer service and CRM contents; the social enterprise; innovative applications; strategy and performance management; and implementing social commerce systems. Each chapter also includes a real-world example as an opening case; application cases and examples; exhibits; a chapter summary; review questions and end-of-chapter exercises. The book also includes a glossary and key terms, as well as supplementary materials that include PowerPoint lecture notes, an Instructor’s Manual, a test bank and five online tutorials.

Nanoparticle Technology Handbook Springer Science & Business Media
This book presents an innovative methodology for the automatic generation of analog integrated circuits (ICs) layout, based on

template descriptions and on evolutionary computational techniques. A design automation tool, LAYGEN II was implemented to validate the proposed approach giving special emphasis to reusability of expert design knowledge and to efficiency on retargeting operations.

Computational Optimization, Methods and Algorithms John Wiley & Sons

This textbook comprehensively explores the foundational principles, algorithms, and applications of intelligent optimization, making it an ideal resource for both undergraduate and postgraduate artificial intelligence courses. It remains equally valuable for active researchers and individuals engaged in self-study. Serving as a significant reference, it delves into advanced topics within the evolutionary computation field, including multi-objective optimization, dynamic optimization, constrained optimization, robust optimization, expensive optimization, and other pivotal scientific studies related to optimization. Designed to be approachable and inclusive, this textbook equips readers with the essential mathematical background necessary for understanding intelligent optimization. It employs an accessible writing style, complemented by extensive pseudo-code and diagrams that vividly illustrate the mechanisms, principles, and algorithms of optimization. With a focus on practicality, this textbook provides diverse real-world application examples spanning engineering, games, logistics, and other domains, enabling readers to confidently apply intelligent techniques to actual optimization problems. Recognizing the importance of hands-on experience, the textbook introduces the Open-source Framework for Evolutionary Computation platform (OFEC) as a user-friendly tool. This platform serves as a comprehensive toolkit for implementing, evaluating, visualizing, and benchmarking various optimization algorithms. The book guides readers on maximizing the utility of OFEC for conducting experiments and analyses in the field of evolutionary computation, facilitating a deeper understanding of intelligent optimization through practical application.

Social Commerce Springer

Because of their unique properties (size, shape, and surface functions), functional materials are gaining significant attention in the areas of energy conversion and storage, sensing, electronics, photonics, and biomedicine. Within the chapters of this book written by well-known researchers, one will find the range of methods that have been developed for preparation and functionalization of organic, inorganic and hybrid structures which are the necessary building blocks for the architecture of various advanced functional materials. The book discusses these innovative methodologies and research strategies, as well as provides a comprehensive and detailed overview of the cutting-edge research on the processing, properties and technology developments of advanced functional materials and their applications. Specifically, Advanced Functional Materials: Compiles the objectives related to functional materials and provides detailed reviews of fundamentals, novel production methods, and frontiers of functional materials, including metalic oxides, conducting polymers, carbon nanotubes, discotic liquid crystalline dimers, calixarenes, crown ethers, chitosan and graphene. Discusses the production and characterization of these materials, while mentioning recent approaches developed as well

as their uses and applications for sensitive chemiresistors, optical and electronic materials, solar hydrogen generation, supercapacitors, display and organic light-emitting diodes, functional adsorbents, and antimicrobial and biocompatible layer formation. This volume in the Advanced Materials Book Series includes twelve chapters divided into two main areas: Part 1: Functional Metal Oxides: Architecture, Design and Applications and Part 2: Multifunctional Hybrid Materials: Fundamentals and Frontiers

Multi-Objective Optimization using Artificial Intelligence Techniques Springer

Showcasing the expertise of top-tier specialists who contributed to the newly released guidelines for the care of thrombosis in cancer patients, this exciting guide was written and edited by members of the American Society of Clinical Oncology panel, (ASCO), on the prevention and treatment of cancer-associated thrombosis, among others, and provides

Advanced Functional Materials Elsevier

Despite the fact that in the digital domain, designers can take full benefits of IPs and design automation tools to synthesize and design very complex systems, the analog designers' task is still considered as a 'handcraft', cumbersome and very time consuming process. Thus, tremendous efforts are being deployed to develop new design methodologies in the analog/RF and mixed-signal domains. This book collects 16 state-of-the-art contributions devoted to the topic of systematic design of analog, RF and mixed signal circuits. Divided in the two parts Methodologies and Techniques recent theories, synthesis techniques and design methodologies, as well as new sizing approaches in the field of robust analog and mixed signal design automation are presented for researchers and R/D engineers.

Materials for Energy Springer

Providing an overview of sugar-based technologies, this book is a valuable resource for chemists working to develop greener synthetic routes to chemicals and pharmaceuticals.

Dorland's Dictionary of Medical Acronyms and Abbreviations E-Book CRC Press

This book provides a wide-range exploration on the ongoing research and developmental events in environmental nanotechnology. Emerging nanomaterials and its technology have been known to offer unique advantages and are continually showing promising potential attracting continuous global attention. This work thus discusses experimental studies of various nanomaterials along with their design and applications and with specific attention to chemical reactions and their challenges for catalytic systems. It will make a noteworthy appeal to scientists and researchers working in the field of nanotechnology for environmental sciences.

Solid Phase Microextraction Elsevier Health Sciences

Medical acronyms and abbreviations offer convenience, but those countless shortcuts can often be confusing. Now a part of the popular Dorland's suite of products, this reference features thousands of terms from across various medical specialties. Its alphabetical arrangement makes for quick reference, and expanded coverage of symbols ensures they are easier to find. Effective communication plays an important role in all medical settings, so turn to this trusted volume for nearly any medical abbreviation you might encounter. Symbols section makes it

easier to locate unusual or seldom-used symbols. Convenient alphabetical format allows you to find the entry you need more intuitively. More than 90,000 entries and definitions. Many new and updated entries including terminology in expanding specialties, such as Nursing; Physical, Occupational, and Speech Therapies; Transcription and Coding; Computer and Technical Fields. New section on abbreviations to avoid, including Joint Commission abbreviations that are not to be used. Incorporates updates suggested by the Institute for Safe Medication Practices (ISMP).

Linux Dictionary John Wiley & Sons

Multi-Objective Optimization Problems (MOPs) deal with optimizing several objectives simultaneously and have diverse applications in engineering, economics, logistics, etc. The methods for solving MOPs can generally be classified into stochastic and deterministic approaches. Deterministic approaches are capable of finding the global solution even though they are computationally burdensome. Stochastic methods, on the other hand, can save on computations significantly, although they do not guarantee to find the global solution. In engineering applications, MOPs can become nonlinear, multi-modal, high dimensional, and have complex structured solutions that makes them more challenging. This theses follows two major goals. Firstly, it presents new methods and algorithms for solving engineering MOPs by hybridizing the existing methods and comparing their effectiveness by using benchmark problems. The hybrid method combines an evolutionary algorithm with a cell mapping method in order to reduce the computational time while maintaining the quality of the solution. Implementation details on parallel CPU/GPU programming of such methods are discussed as well. The second goal of this thesis is to introduce new applications of MOPs in different areas of engineering such as control design, path planning, fractional systems and airfoil design.