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Handbook of Food Process Design, 2 Volume Set - Jasim Ahmed 2012-05-21
In the 21st Century, processing food is no longer a simple or straightforward matter. Ongoing advances in manufacturing have placed new demands on the design and methodology of food processes. A highly interdisciplinary science, food process design draws upon the principles of chemical and mechanical engineering, microbiology, chemistry, nutrition and economics, and is of central importance to the food industry. Process design is the core of food engineering, and is concerned at its root with taking new concepts in food design and developing them through production and eventual consumption. Handbook of Food Process Design is a major new 2-volume work aimed at food engineers and the wider food industry. Comprising 46 original chapters written by a host of leading international food scientists, engineers, academics and systems specialists, the book has been developed to be the most comprehensive guide to food process design ever published. Starting from first principles, the book provides a complete account of food process designs, including heating and cooling, pasteurization, sterilization, refrigeration, drying, crystallization, extrusion, and separation. Mechanical operations including mixing, agitation, size reduction, extraction and leaching processes are fully documented. Novel process designs such as irradiation, high-pressure processing, ultrasound, ohmic heating and pulsed UV-light are also presented. Food packaging processes are considered, and chapters on food quality, safety and commercial imperatives portray the role process design in the broader context of food production and consumption.
Advances in Artificial Intelligence - Ahmed Y. Tawfik 2004-04-16
This book constitutes the refereed proceedings of the 17th Conference of the Canadian Society for Computational Studies of Intelligence, Canadian AI 2004, held in London, Ontario, Canada in May 2004. The 29 revised full papers and 22 revised short papers were carefully reviewed and selected from 105 submissions. These papers are presented together with the extended abstracts of 14 contributions to the graduate students' track. The full papers are organized in topical sections on agents, natural language processing, learning, constraint satisfaction and search, knowledge representation and reasoning, uncertainty, and neural networks.
GAME THEORY FOR MANAGERS - CHADHA, ALKA 2020-07-01
The new edition of the book has been streamlined for effective reading and clarity. It explains the concepts of game theory in a way that is easy to understand and will be useful for the students of MBA programmes. It will help the readers to think strategically in interactions that they may encounter as managers. The book uses a mix of mathematics and intuitive reasoning for efficient learning outcomes. The case studies dwell on diverse issues such as politics, diplomacy, geopolitics, movies, sports, health care, environment, besides business and economics. Each chapter includes Solved Examples, Summary, Key Words and Exercises. An Instructor’s Manual is available for professors who adopt this book that includes PowerPoint slides, answers to select problems given in the text and a variety of multiple-choice

questions. The second edition of the book has expanded the text and included more diagrams for a clearer understanding of concepts such as mixed strategy games, duopoly games, strategic moves and coalition games. It has also updated case-studies on current topics including corona virus pandemic, oil crash, trade war, arms race escalation, etc. TARGET AUDIENCE Management Students

Evolutionary Multi-Criterion Optimization - Eckart Zitzler 2003-06-29

This book constitutes the refereed proceedings of the First International Conference on Multi-Criterion Optimization, EMO 2001, held in Zurich, Switzerland in March 2001. The 45 revised full papers presented were carefully reviewed and selected from a total of 87 submissions. Also included are two tutorial surveys and two invited papers. The book is organized in topical sections on algorithm improvements, performance assessment and comparison, constraint handling and problem decomposition, uncertainty and noise, hybrid and alternative methods, scheduling, and applications of multi-objective optimization in a variety of fields.

New Optimization Techniques in Engineering - Godfrey C. Onwubolu 2013-03-14

Presently, general-purpose optimization techniques such as Simulated Annealing, and Genetic Algorithms, have become standard optimization techniques. Concerted research efforts have been made recently in order to invent novel optimization techniques for solving real life problems, which have the attributes of memory update and population-based search solutions. The book describes a variety of these novel optimization techniques which in most cases outperform the standard optimization techniques in many application areas. New Optimization Techniques in Engineering reports applications and results of the novel optimization techniques considering a multitude of practical problems in the different engineering disciplines – presenting both the background of the subject area and the techniques for solving the problems.

Intelligent Information Processing II - Qing He 2006-01-20

Data Mining is the process of posing queries and extracting useful information, patterns and trends previously unknown from large quantities of data [Thu, 00]. It is the process where intelligent tools are applied in order to extract data patterns [JM, 01]. This encompasses a number of different technical approaches, such as cluster analysis, learning classification and association rules, and finding dependencies. Agents are defined as software entities that perform some set of tasks on behalf of users with some degree of autonomy. This research work deals about developing a automated data mining system which encompasses the familiar data mining algorithms using intelligent agents in object oriented databases and proposing a framework. Because the data mining system uses the intelligent agents, a new user will be able to interact with the data mining system without much data mining technical knowledge. This system will automatically select the appropriate data mining technique and select the necessary field needed from the database at the appropriate time without expecting the users to specify the specific technique and the parameters. Also a new framework is proposed for incorporating intelligent agents with automated data mining. One of the major goals in developing this system is to give the control to the computer for learning automatically by using intelligent agents.

Discrete Problems in Nature Inspired Algorithms - Anupam Prof. Shukla 2017-12-15

This book includes introduction of several algorithms which are exclusively for graph based problems, namely combinatorial optimization problems, path formation problems, etc. Each chapter includes the introduction of the basic traditional nature inspired algorithm and discussion of the modified version for discrete algorithms including problems pertaining to discussed algorithms.

Advances in Structural Engineering—Optimization - Sinan Melih Nigdeli 2020-12-04

This book is an up-to-date source for computation applications of optimization, prediction via artificial intelligence methods, and evaluation of metaheuristic algorithm with different structural applications. As the current interest of researcher, metaheuristic algorithms are a high interest topic area since advance and non-optimized problems via mathematical

methods are challenged by the development of advance and modified algorithms. The artificial intelligence (AI) area is also important in predicting optimum results by skipping long iterative optimization processes. The machine learning used in generation of AI models also needs optimum results of metaheuristic-based approaches. This book is a great source to researcher, graduate students, and bachelor students who gain project about structural optimization. Differently from the academic use, the chapter that emphasizes different scopes and methods can take the interest and help engineer working in design and production of structural engineering projects.

Handbook of AI-based Metaheuristics - Anand J. Kulkarni 2021-09-02

At the heart of the optimization domain are mathematical modeling of the problem and the solution methodologies. The problems are becoming larger and with growing complexity. Such problems are becoming cumbersome when handled by traditional optimization methods. This has motivated researchers to resort to artificial intelligence (AI)-based, nature-inspired solution methodologies or algorithms. The Handbook of AI-based Metaheuristics provides a wide-ranging reference to the theoretical and mathematical formulations of metaheuristics, including bio-inspired, swarm-based, socio-cultural, and physics-based methods or algorithms; their testing and validation, along with detailed illustrative solutions and applications; and newly devised metaheuristic algorithms. This will be a valuable reference for researchers in industry and academia, as well as for all Master's and PhD students working in the metaheuristics and applications domains.

Genetic Algorithms and Engineering Design - Mitsuo Gen 1997-01-21

The last few years have seen important advances in the use ofgenetic algorithms to address challenging optimization problems inindustrial engineering. Genetic Algorithms and Engineering Designis the only book to cover the most recent technologies and theirapplication to manufacturing, presenting a comprehensive and fullyup-to-date treatment of genetic algorithms in industrialengineering and operations research. Beginning with a tutorial on genetic algorithm fundamentals andtheir use in solving constrained and combinatorial optimizationproblems, the book applies these techniques to problems in specificareas--sequencing, scheduling and production plans, transportationand vehicle routing, facility layout, location-allocation, andmore. Each topic features a clearly written problem description,mathematical model, and summary of conventional heuristicalgorithms. All algorithms are explained in intuitive, rather thanhighly-technical, language and are reinforced with illustrativefigures and numerical examples. Written by two internationally acknowledged experts in the field,Genetic Algorithms and Engineering Design features originalmaterial on the foundation and application of genetic algorithms,and also standardizes the terms and symbols used in othersources--making this complex subject truly accessible to thebeginner as well as to the more advanced reader. Ideal for both self-study and classroom use, this self-containedreference provides indispensable state-of-the-art guidance toprofessionals and students working in industrial engineering,management science, operations research, computer science, andartificial intelligence. The only comprehensive, state-of-the-arttreatment available on the use of genetic algorithms in industrialengineering and operations research . . . Written by internationally recognized experts in the field ofgenetic algorithms and artificial intelligence, Genetic Algorithmsand Engineering Design provides total coverage of currenttechnologies and their application to manufacturing systems.Incorporating original material on the foundation and applicationof genetic algorithms, this unique resource also standardizes theterms and symbols used in other sources--making this complexsubject truly accessible to students as well as experiencedprofessionals. Designed for clarity and ease of use, thisself-contained reference: * Provides a comprehensive survey of selection strategies, penaltytechniques, and genetic operators used for constrained andcombinatorial optimization problems * Shows how to use genetic algorithms to make production schedules,solve facility/location problems, make transportation/vehiclerouting plans, enhance system reliability, and much more * Contains

detailed numerical examples, plus more than 160auxiliary figures to make solution procedures transparent andunderstandable

Artificial Neural Nets and Genetic Algorithms - Andrej Dobnikar 2012-12-06

From the contents: Neural networks – theory and applications: NNs (= neural networks) classifier on continuous data domains– quantum associative memory – a new class of neuron-like discrete filters to image processing – modular NNs for improving generalisation properties – presynaptic inhibition modelling for image processing application – NN recognition system for a curvature primal sketch – NN based nonlinear temporal-spatial noise rejection system – relaxation rate for improving Hopfield network – Oja's NN and influence of the learning gain on its dynamics Genetic algorithms – theory and applications: transposition: a biological-inspired mechanism to use with GAs (= genetic algorithms) – GA for decision tree induction – optimising decision classifications using GAs – scheduling tasks with intertask communication onto multiprocessors by GAs – design of robust networks with GA – effect of degenerate coding on GAs – multiple traffic signal control using a GA – evolving musical harmonisation – niched-penalty approach for constraint handling in GAs – GA with dynamic population size – GA with dynamic niche clustering for multimodal function optimisation Soft computing and uncertainty: self-adaptation of evolutionary constructed decision trees by information spreading – evolutionary programming of near optimal NNs

Optimization Techniques and Applications with Examples - Xin-She Yang 2018-09-24

A guide to modern optimization applications and techniques in newly emerging areas spanning optimization, data science, machine intelligence, engineering, and computer sciences Optimization Techniques and Applications with Examples introduces the fundamentals of all the commonly used techniques in optimization that encompass the broadness and diversity of the methods (traditional and new) and algorithms. The author—a noted expert in the field—covers a wide range of topics including mathematical foundations, optimization formulation, optimality conditions, algorithmic complexity, linear programming, convex optimization, and integer programming. In addition, the book discusses artificial neural network, clustering and classifications, constraint-handling, queueing theory, support vector machine and multi-objective optimization, evolutionary computation, nature-inspired algorithms and many other topics. Designed as a practical resource, all topics are explained in detail with step-by-step examples to show how each method works. The book’s exercises test the acquired knowledge that can be potentially applied to real problem solving. By taking an informal approach to the subject, the author helps readers to rapidly acquire the basic knowledge in optimization, operational research, and applied data mining. This important resource: Offers an accessible and state-of-the-art introduction to the main optimization techniques Contains both traditional optimization techniques and the most current algorithms and swarm intelligence-based techniques Presents a balance of theory, algorithms, and implementation Includes more than 100 worked examples with step-by-step explanations Written for upper undergraduates and graduates in a standard course on optimization, operations research and data mining, Optimization Techniques and Applications with Examples is a highly accessible guide to understanding the fundamentals of all the commonly used techniques in optimization.

Handbook of Computational Intelligence in Manufacturing and Production Management - Laha, Dipak 2007-11-30

During the last two decades, computer and information technologies have forced great changes in the ways businesses manage operations in meeting the desired quality of products and services, customer demands, competition, and other challenges. The Handbook of Computational Intelligence in Manufacturing and Production Management focuses on new developments in computational intelligence in areas such as forecasting, scheduling, production planning, inventory control, and aggregate planning, among others. This comprehensive collection of research provides cutting-edge knowledge on information technology developments for both researchers and professionals in fields such as operations and production management, Web engineering,

artificial intelligence, and information resources management.

Handbook of Food Process Design, 2 Volume Set - Jasim Ahmed 2012-02-27

In the 21st Century, processing food is no longer a simple or straightforward matter. Ongoing advances in manufacturing have placed new demands on the design and methodology of food processes. A highly interdisciplinary science, food process design draws upon the principles of chemical and mechanical engineering, microbiology, chemistry, nutrition and economics, and is of central importance to the food industry. Process design is the core of food engineering, and is concerned at its root with taking new concepts in food design and developing them through production and eventual consumption. Handbook of Food Process Design is a major new 2-volume work aimed at food engineers and the wider food industry. Comprising 46 original chapters written by a host of leading international food scientists, engineers, academics and systems specialists, the book has been developed to be the most comprehensive guide to food process design ever published. Starting from first principles, the book provides a complete account of food process designs, including heating and cooling, pasteurization, sterilization, refrigeration, drying, crystallization, extrusion, and separation. Mechanical operations including mixing, agitation, size reduction, extraction and leaching processes are fully documented. Novel process designs such as irradiation, high-pressure processing, ultrasound, ohmic heating and pulsed UV-light are also presented. Food packaging processes are considered, and chapters on food quality, safety and commercial imperatives portray the role process design in the broader context of food production and consumption.

Parallel Problem Solving from Nature-PPSN VI - Marc Schoenauer 2000-09-06

This book constitutes the refereed proceedings of the 6th International Conference on Parallel Problem Solving from Nature, PPSN VI, held in Paris, France in September 2000. The 87 revised full papers presented together with two invited papers were carefully reviewed and selected from 168 submissions. The presentations are organized in topical sections on analysis and theory of evolutionary algorithms, genetic programming, scheduling, representations and operators, co-evolution, constraint handling techniques, noisy and non-stationary environments, combinatorial optimization, applications, machine learning and classifier systems, new algorithms and metaphors, and multiobjective optimization.

Multiobjective Optimization - Jürgen Branke 2008-10-18

Multiobjective optimization deals with solving problems having not only one, but multiple, often conflicting, criteria. Such problems can arise in practically every field of science, engineering and business, and the need for efficient and reliable solution methods is increasing. The task is challenging due to the fact that, instead of a single optimal solution, multiobjective optimization results in a number of solutions with different trade-offs among criteria, also known as Pareto optimal or efficient solutions. Hence, a decision maker is needed to provide additional preference information and to identify the most satisfactory solution. Depending on the paradigm used, such information may be introduced before, during, or after the optimization process. Clearly, research and application in multiobjective optimization involve expertise in optimization as well as in decision support. This state-of-the-art survey originates from the International Seminar on Practical Approaches to Multiobjective Optimization, held in Dagstuhl Castle, Germany, in December 2006, which brought together leading experts from various contemporary multiobjective optimization fields, including evolutionary multiobjective optimization (EMO), multiple criteria decision making (MCDM) and multiple criteria decision aiding (MCDA). This book gives a unique and detailed account of the current status of research and applications in the field of multiobjective optimization. It contains 16 chapters grouped in the following 5 thematic sections: Basics on Multiobjective Optimization; Recent Interactive and Preference-Based Approaches; Visualization of Solutions; Modelling, Implementation and Applications; and Quality Assessment, Learning, and Future Challenges.

Engineering Optimization - S. S. Rao 2000

A Rigorous Mathematical Approach To

Identifying A Set Of Design Alternatives And Selecting The Best Candidate From Within That Set, Engineering Optimization Was Developed As A Means Of Helping Engineers To Design Systems That Are Both More Efficient And Less Expensive And To Develop New Ways Of Improving The Performance Of Existing Systems.Thanks To The Breathtaking Growth In Computer Technology That Has Occurred Over The Past Decade, Optimization Techniques Can Now Be Used To Find Creative Solutions To Larger, More Complex Problems Than Ever Before. As A Consequence, Optimization Is Now Viewed As An Indispensable Tool Of The Trade For Engineers Working In Many Different Industries, Especially The Aerospace, Automotive, Chemical, Electrical, And Manufacturing Industries.In Engineering Optimization, Professor Singiresu S. Rao Provides An Application-Oriented Presentation Of The Full Array Of Classical And Newly Developed Optimization Techniques Now Being Used By Engineers In A Wide Range Of Industries. Essential Proofs And Explanations Of The Various Techniques Are Given In A Straightforward, User-Friendly Manner, And Each Method Is Copiously Illustrated With Real-World Examples That Demonstrate How To Maximize Desired Benefits While Minimizing Negative Aspects Of Project Design.Comprehensive, Authoritative, Up-To-Date, Engineering Optimization Provides In-Depth Coverage Of Linear And Nonlinear Programming, Dynamic Programming, Integer Programming, And Stochastic Programming Techniques As Well As Several Breakthrough Methods, Including Genetic Algorithms, Simulated Annealing, And Neural Network-Based And Fuzzy Optimization Techniques.Designed To Function Equally Well As Either A Professional Reference Or A Graduate-Level Text, Engineering Optimization Features Many Solved Problems Taken From Several Engineering Fields, As Well As Review Questions, Important Figures, And Helpful References.Engineering Optimization Is A Valuable Working Resource For Engineers Employed In Practically All Technological Industries. It Is Also A Superior Didactic Tool For Graduate Students Of Mechanical, Civil, Electrical, Chemical And Aerospace Engineering.

Algorithms for Optimization - Mykel J. Kochenderfer 2019-03-12

A comprehensive introduction to optimization with a focus on practical algorithms for the design of engineering systems. This book offers a comprehensive introduction to optimization with a focus on practical algorithms. The book approaches optimization from an engineering perspective, where the objective is to design a system that optimizes a set of metrics subject to constraints. Readers will learn about computational approaches for a range of challenges, including searching high-dimensional spaces, handling problems where there are multiple competing objectives, and accommodating uncertainty in the metrics. Figures, examples, and exercises convey the intuition behind the mathematical approaches. The text provides concrete implementations in the Julia programming language. Topics covered include derivatives and their generalization to multiple dimensions; local descent and first- and second-order methods that inform local descent; stochastic methods, which introduce randomness into the optimization process; linear constrained optimization, when both the objective function and the constraints are linear; surrogate models, probabilistic surrogate models, and using probabilistic surrogate models to guide optimization; optimization under uncertainty; uncertainty propagation; expression optimization; and multidisciplinary design optimization. Appendixes offer an introduction to the Julia language, test functions for evaluating algorithm performance, and mathematical concepts used in the derivation and analysis of the optimization methods discussed in the text. The book can be used by advanced undergraduates and graduate students in mathematics, statistics, computer science, any engineering field, (including electrical engineering and aerospace engineering), and operations research, and as a reference for professionals.

Applications of Bat Algorithm and its Variants - Nilanjan Dey 2020-06-09

This book highlights essential concepts in connection with the traditional bat algorithm and its recent variants, as well as its application to find optimal solutions for a variety of real-

world engineering and medical problems. Today, swarm intelligence-based meta-heuristic algorithms are extensively being used to address a wide range of real-world optimization problems due to their adaptability and robustness. Developed in 2009, the bat algorithm (BA) is one of the most successful swarm intelligence procedures, and has been used to tackle optimization tasks for more than a decade. The BA's mathematical model is quite straightforward and easy to understand and enhance, compared to other swarm approaches. Hence, it has attracted the attention of researchers who are working to find optimal solutions in a diverse range of domains, such as N-dimensional numerical optimization, constrained/unconstrained optimization and linear/nonlinear optimization problems. Along with the traditional BA, its enhanced versions are now also being used to solve optimization problems in science, engineering and medical applications around the globe.

Evolutionary Algorithms for Solving Multi-Objective Problems - Carlos Coello Coello 2013-03-09

Researchers and practitioners alike are increasingly turning to search, op timization, and machine-learning procedures based on natural selection and natural genetics to solve problems across the spectrum of human endeavor. These genetic algorithms and techniques of evolutionary computation are solv ing problems and inventing new hardware and software that rival human designs. The Kluwer Series on Genetic Algorithms and Evolutionary Computation pub lishes research monographs, edited collections, and graduate-level texts in this rapidly growing field. Primary areas of coverage include the theory, implemen tation, and application of genetic algorithms (GAs), evolution strategies (ESs), evolutionary programming (EP), learning classifier systems (LCSs) and other variants of genetic and evolutionary computation (GEC). The series also pub lishes texts in related fields such as artificial life, adaptive behavior, artificial immune systems, agent-based systems, neural computing, fuzzy systems, and quantum computing as long as GEC techniques are part of or inspiration for the system being described. This encyclopedic volume on the use of the algorithms of genetic and evolu tionary computation for the solution of multi-objective problems is a landmark addition to the literature that comes just in the nick of time. Multi-objective evolutionary algorithms (MOEAs) are receiving increasing and unprecedented attention. Researchers and practitioners are finding an irresistible match be tween the popUlation available in most genetic and evolutionary algorithms and the need in multi-objective problems to approximate the Pareto trade-off curve or surface.

Engineering Design Optimization - Joaquim R. R. A. Martins 2021-11-18

Based on course-tested material, this rigorous yet accessible graduate textbook covers both fundamental and advanced optimization theory and algorithms. It covers a wide range of numerical methods and topics, including both gradient-based and gradient-free algorithms, multidisciplinary design optimization, and uncertainty, with instruction on how to determine which algorithm should be used for a given application. It also provides an overview of models and how to prepare them for use with numerical optimization, including derivative computation. Over 400 high-quality visualizations and numerous examples facilitate understanding of the theory, and practical tips address common issues encountered in practical engineering design optimization and how to address them. Numerous end-of-chapter homework problems, progressing in difficulty, help put knowledge into practice. Accompanied online by a solutions manual for instructors and source code for problems, this is ideal for a one- or two-semester graduate course on optimization in aerospace, civil, mechanical, electrical, and chemical engineering departments.

ELECTRONICS IN MEDICINE AND BIOMEDICAL INSTRUMENTATION - NANDINI K. JOG 2013-02-13

Medical electronics is using vast and varied applications in numerous spheres of human endeavour—ranging from communication, biomedical engineering to re-creational activities. This book in its second edition continues to give a detailed insight into the basics of human physiology. It also educates the readers about the role of electronics in medicine and the various state-of-the-art equipments

being used in hospitals around the world. The text presents the reader with a deep understanding of the human body, the functions of its various organs, and then moves on to the biomedical instruments used to decipher with greater precision the signals in relation to the body's state of well-being. The book incorporates the latest research and developments in the field of biomedical instrumentation. Numerous diagrams and photographs of medical instruments make the book visually appealing and interesting. Primarily intended as a text for the students of Electronics and Instrumenta-tion Engineering and Biomedical Engineering, the book would also be of immense interest to medical practitioners. New to This Edition Magnetoencyphalography (MEG) and features of Mediscope software used for medical imaging Topics on optical fiber transducers, and fiber optic microphones used in MRI scanning Discusses in detail the medical instruments like colorimeter, spectro-photometer and flame photometry and auto analyzers for the study of toxic levels in the body Includes a detailed description of pacemakers and defibrillators, and tests like Phonocardiography, Vector Cardiography, Nuclear stress test, MRI stress test Addition of the procedure of dialysis, hemodialysis and peritoneal dialysis

Advances in Evolutionary Computing - Ashish Ghosh 2012-12-06

This book provides a collection of fourty articles containing new material on both theoretical aspects of Evolutionary Computing (EC), and demonstrating the usefulness/success of it for various kinds of large-scale real world problems. Around 23 articles deal with various theoretical aspects of EC and 17 articles demonstrate the success of EC methodologies. These articles are written by leading experts of the field from different countries all over the world.

Applications of Multi-Objective Evolutionary Algorithms - Carlos A Coello Coello 2004-12-08

This book presents an extensive variety of multi-objective problems across diverse disciplines, along with statistical solutions using multi-objective evolutionary algorithms (MOEAs). The topics discussed serve to promote a wider understanding as well as the use of MOEAs, the aim being to find good solutions for high-dimensional real-world design applications. The book contains a large collection of MOEA applications from many researchers, and thus provides the practitioner with detailed algorithmic direction to achieve good results in their selected problem domain. Contents:An Introduction to Multi-Objective Evolutionary Algorithms and Their ApplicationsOptimal Design of Industrial Electromagnetic Devices: A Multiobjective Evolutionary ApproachUsing a Particle Swarm Optimizer with a Multi-Objective Selection Scheme to Design Combinational Logic CircuitsAutomatic Control System Design via a Multiobjective Evolutionary AlgorithmEvolutionary Multi-Objective Optimization of TrussesA Multi-Objective Evolutionary Algorithm for the Covering Tour ProblemMultiobjective Aerodynamic Design and Visualization of Supersonic Wings by Using Adaptive Range Multiobjective Genetic AlgorithmsMutli-Objective Spectroscopic Data Analysis of Inertial Confinement Fusion Implosion Cores: Plasma Gradient DeterminationOn Machine Learning with Multiobjective Genetic Optimizationand other papers Readership: Undergraduates, graduate students, researchers, academics, practitioners and professionals interested in evolutionary algorithms. Keywords:Evolutionary Multiobjective Optimization;Multi-Objective Optimization;Pareto Optimization;OptimizationKey Features:Detailed MOEA applications discussed by international expertsState-of-the-art practical insights in tackling statistical optimization with MOEAsA unique monograph covering a wide spectrum of real-world applicationsStep-by-step discussion of MOEA applications in a variety of domains

Multi-Objective Optimization using Evolutionary Algorithms - Kalyanmoy Deb 2001-07-05

Evolutionary algorithms are relatively new, but very powerful techniques used to find solutions to many real-world search and optimization problems. Many of these problems have multiple objectives, which leads to the need to obtain a set of optimal solutions, known as effective solutions. It has been found that using evolutionary algorithms is a highly effective way of finding multiple effective solutions in a single simulation run. Comprehensive coverage of this growing area of research Carefully introduces each algorithm with examples and in-depth

discussion Includes many applications to real-world problems, including engineering design and scheduling Includes discussion of advanced topics and future research Can be used as a course text or for self-study Accessible to those with limited knowledge of classical multi-objective optimization and evolutionary algorithms The integrated presentation of theory, algorithms and examples will benefit those working and researching in the areas of optimization, optimal design and evolutionary computing. This text provides an excellent introduction to the use of evolutionary algorithms in multi-objective optimization, allowing use as a graduate course text or for self-study.

Evolutionary Multi-Criterion Optimization - Carlos Coello Coello 2005-01-28

This book constitutes the refereed proceedings of the Third International Conference on Evolutionary Multi-Criterion Optimization, EMO 2005, held in Guanajuato, Mexico, in March 2005. The 59 revised full papers presented together with 2 invited papers and the summary of a tutorial were carefully reviewed and selected from the 115 papers submitted. The papers are organized in topical sections on algorithm improvements, incorporation of preferences, performance analysis and comparison, uncertainty and noise, alternative methods, and applications in a broad variety of fields.

OPTIMIZATION FOR ENGINEERING DESIGN - KALYANMOY DEB 2012-11-18

This well-received book, now in its second edition, continues to provide a number of optimization algorithms which are commonly used in computer-aided engineering design. The book begins with simple single-variable optimization techniques, and then goes on to give unconstrained and constrained optimization techniques in a step-by-step format so that they can be coded in any user-specific computer language. In addition to classical optimization methods, the book also discusses Genetic Algorithms and Simulated Annealing, which are widely used in engineering design problems because of their ability to find global optimum solutions. The second edition adds several new topics of optimization such as design and manufacturing, data fitting and regression, inverse problems, scheduling and routing, data mining, intelligent system design, Lagrangian duality theory, and quadratic programming and its extension to sequential quadratic programming. It also extensively revises the linear programming algorithms section in the Appendix. This edition also includes more number of exercise problems. The book is suitable for senior undergraduate/postgraduate students of mechanical, production and chemical engineering. Students in other branches of engineering offering optimization courses as well as designers and decision-makers will also find the book useful. Key Features Algorithms are presented in a step-by-step format to facilitate coding in a computer language. Sample computer programs in FORTRAN are appended for better comprehension. Worked-out examples are illustrated for easy understanding. The same example problems are solved with most algorithms for a comparative evaluation of the algorithms.

Bioinspired Optimization Methods and Their Applications - Bogdan Filipič 2020-11-16

This book constitutes the refereed proceedings of the 9th International Conference on Bioinspired Optimization Methods and Their Applications, BIOMA 2020, held in Brussels, Belgium, in November 2020. The 24 full papers presented in this book were carefully reviewed and selected from 68 submissions. The papers in this BIOMA proceedings specialized in bioinspired algorithms as a means for solving the optimization problems and came in two categories: theoretical studies and methodology advancements on the one hand, and algorithm adjustments and their applications on the other. Due to the Corona pandemic BIOMA 2020 was held as a virtual event.

Introduction to Engineering Design - Andrew Samuel 1999-10-22

Introduction to Engineering Design is a completely novel text covering the basic elements of engineering design for structural integrity. Some of the most important concepts that students must grasp are those relating to 'design thinking' and reasoning, and not just those that relate to simple theoretical and analytical approaches. This is what will enable them to get to grips with *practical* design problems, and the starting point is thinking

about problems in a 'deconstructionist' sense. By analysing design problems as sophisticated systems made up of simpler constituents, and evolving a solution from known experience of such building blocks, it is possible to develop an approach that will enable the student to tackle even completely alien design scenarios with confidence. The other essential aspect of the design process - the concept of failure, and its avoidance - is also examined in detail, and the importance not only of contemplating expected failure conditions at the design stage but also checking those conditions as they apply to the completed design is stressed. These facets in combination offer a systematic method of considering the design process and one that will undoubtedly find favour with many students, teaching staff and practising engineers alike.

Evolutionary Algorithms in Engineering Applications - Dipankar Dasgupta 2013-06-29

Evolutionary algorithms are general-purpose search procedures based on the mechanisms of natural selection and population genetics. They are appealing because they are simple, easy to interface, and easy to extend. This volume is concerned with applications of evolutionary algorithms and associated strategies in engineering. It will be useful for engineers, designers, developers, and researchers in any scientific discipline interested in the applications of evolutionary algorithms. The volume consists of five parts, each with four or five chapters. The topics are chosen to emphasize application areas in different fields of engineering. Each chapter can be used for self-study or as a reference by practitioners to help them apply evolutionary algorithms to problems in their engineering domains.

Soft Computing Applications in Industry - Bhanu Prasad 2008-02-13

Softcomputing techniques play a vital role in the industry. This book presents several important papers presented by some of the well-known scientists from all over the globe. The main techniques of soft computing presented include ant-colony optimization, artificial immune systems, artificial neural networks, Bayesian models. The book includes various examples and application domains such as bioinformatics, detection of phishing attacks, and fault detection of motors.

Evolutionary Multi-Criterion Optimization - Carlos A. Coello Coello 2005-02-17

This book constitutes the refereed proceedings of the Third International Conference on Evolutionary Multi-Criterion Optimization, EMO 2005, held in Guanajuato, Mexico, in March 2005. The 59 revised full papers presented together with 2 invited papers and the summary of a tutorial were carefully reviewed and selected from the 115 papers submitted. The papers are organized in topical sections on algorithm improvements, incorporation of preferences, performance analysis and comparison, uncertainty and noise, alternative methods, and applications in a broad variety of fields.

Computational Methods for Optimizing Manufacturing Technology: Models and Techniques - Davim, J. Paulo 2012-02-29

"This book contains the latest research developments in manufacturing technology and its optimization, and demonstrates the fundamentals of new computational approaches and the range of their potential application"--Provided by publisher.

Handbook on Decision Making - Julian Andres Zapata-Cortes 2022-10-28

This book presents different techniques and methodologies used to improve the intelligent decision-making process and increase the likelihood of success in companies of different sectors such as Financial Services, Education, Supply Chain, Energy Systems, Health Services, and others. The book contains and consolidates innovative and high-quality research contributions regarding the implementation of techniques and methodologies applied in different sectors. The scope is to disseminate current trends knowledge in the implementation of artificial intelligence techniques and methodologies in different fields such as: Logistics, Software Development, Big Data, Internet of Things, Simulation, among others. The book contents are useful for Ph.D. researchers, Ph.D. students, master and undergraduate students of different areas such as Industrial Engineering, Computer Science, Information Systems, Data Analytics, and others.

Multi-objective Evolutionary Optimisation for Product Design and Manufacturing - Lihui Wang 2011-09-06

With the increasing complexity and dynamism in today's product design and manufacturing, more optimal, robust and practical approaches and systems are needed to support product design and manufacturing activities. Multi-objective Evolutionary Optimisation for Product Design and Manufacturing presents a focused collection of quality chapters on state-of-the-art research efforts in multi-objective evolutionary optimisation, as well as their practical applications to integrated product design and manufacturing. Multi-objective Evolutionary Optimisation for Product Design and Manufacturing consists of two major sections. The first presents a broad-based review of the key areas of research in multi-objective evolutionary optimisation. The second gives in-depth treatments of selected methodologies and systems in intelligent design and integrated manufacturing. Recent developments and innovations in multi-objective evolutionary optimisation make Multi-objective Evolutionary Optimisation for Product Design and Manufacturing a useful text for a broad readership, from academic researchers to practicing engineers.

Numerical Modelling and Design of Electrical Machines and Devices - Kay Hameyer 1999-05-21

This text provides an overview of numerical field computational methods and, in particular, of the finite element method (FEM) in magnetics. Detailed attention is paid to the practical use of the FEM in designing electromagnetic devices such as motors, transformers and actuators. Based on the authors' extensive experience of teaching numerical techniques to students and design engineers, the book is ideal for use as a text at undergraduate and graduate level, or as a primer for practising engineers who wish to learn the fundamentals and immediately apply these to actual design problems. Contents: Introduction; Computer Aided Design in Magnetics; Electromagnetic Fields; Potentials and Formulations; Field Computation and Numerical Techniques; Coupled Field Problems; Numerical Optimisation; Linear System Equation Solvers; Modelling of Electrostatic and Magnetic Devices; Examples of Computed Models.

Evolutionary and Swarm Intelligence Algorithms - Jagdish Chand Bansal 2018-06-06

This book is a delight for academics, researchers and professionals working in evolutionary and swarm computing, computational intelligence, machine learning and engineering design, as well as search and optimization in general. It provides an introduction to the design and development of a number of popular and recent swarm and evolutionary algorithms with a focus on their applications in engineering problems in diverse domains. The topics discussed include particle swarm optimization, the artificial bee colony algorithm, Spider Monkey optimization algorithm, genetic algorithms, constrained multi-objective evolutionary algorithms, genetic programming, and evolutionary fuzzy systems. A friendly and informative treatment of the topics makes this book an ideal reference for beginners and those with experience alike.

Artificial Evolution - Pierre Liardet 2004-04-08

This book constitutes the thoroughly refereed post-proceedings of the 6th International Conference on Artificial Evolution, EA 2003, held in Marseilles, France in October 2003. The 32 revised full papers presented were carefully selected and improved during two rounds of reviewing and revision. The papers are organized in topical sections on theoretical issues, algorithmic issues, applications, implementation issues, genetic programming, coevolution and agent systems, artificial life, and cellular automata.

Hybrid Evolutionary Algorithms - Crina Grosan 2007-08-29

This edited volume is targeted at presenting the latest state-of-the-art methodologies in "Hybrid Evolutionary Algorithms". The chapters deal with the theoretical and methodological aspects, as well as various applications to many real world problems from science, technology, business or commerce. Overall, the book has 14 chapters including an introductory chapter giving the fundamental definitions and some important research challenges. The contributions were selected on the basis of fundamental ideas/concepts rather than the thoroughness of techniques deployed.

Decision Sciences - Raghu Nandan Sengupta 2016-11-30

This handbook is an endeavour to cover many current, relevant, and essential topics related to decision sciences in a scientific manner. Using

this handbook, graduate students, researchers, as well as practitioners from engineering, statistics, sociology, economics, etc. will find a new and refreshing paradigm shift as to how these topics can be put to use beneficially. Starting from the basics to advanced concepts, authors hope to make the readers well aware of the different theoretical and practical ideas, which are the focus of study in decision sciences nowadays. It includes an excellent bibliography/reference/journal list, information about a variety of datasets, illustrated pseudo-codes, and discussion of future trends in research. Covering topics ranging from optimization, networks and games, multi-objective optimization, inventory theory, statistical methods, artificial neural networks, times series analysis, simulation modeling, decision support system, data envelopment analysis, queueing theory, etc., this reference book is an attempt to make this area more meaningful for varied readers. Noteworthy features of this handbook are in-depth coverage of different topics, solved practical examples, unique datasets for a variety of examples in the areas of decision sciences, in-depth analysis of problems through colored charts, 3D diagrams, and discussions about software.