
Bee Colony Optimization Matlab Code

Applying Computational Intelligence
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Machine Learning, Optimization, and Big Data
Meta-Heuristics Optimization Algorithms in Engineering, Business, Economics, and Finance
Handbook of Hydroinformatics
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Evolutionary Data Clustering: Algorithms and Applications
Colliding Bodies Optimization
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Soft Computing for Problem Solving
Swarm Intelligence Algorithms
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Swarm Intelligence Algorithms (Two Volume Set)
Topics in Modal Analysis & Parameter Identification, Volume 8

FRANCIS HANEY

Applying Computational Intelligence Springer

Classical and Recent Aspects of Power System Optimization presents conventional and meta-heuristic optimization methods and algorithms for power system studies. The classic aspects of optimization in power systems, such as optimal power flow, economic dispatch, unit commitment and power quality optimization are covered, as are issues relating to distributed generation sizing, allocation problems, scheduling of renewable resources, energy storage, power reserve based problems, efficient use of smart grid capabilities, and protection studies in modern power systems. The book brings together innovative research outcomes, programs, algorithms and approaches that consolidate the present state and future challenges for power. - Analyzes and compares several aspects of optimization for power systems which has never been addressed in one reference - Details real-life industry application examples for each chapter (e.g. energy storage and power reserve problems) - Provides practical training on theoretical developments and application of advanced methods for optimum electrical energy for realistic engineering problems

Research Anthology on Clean Energy Management and Solutions Springer

In theory, there is no difference between theory and practice. But, in practice, there is. Jan L. A. van de Snepscheut The flow of academic ideas in the area of computational intelligence has penetrated industry with tremendous speed and persistence. Thousands of applications have proved the practical potential of fuzzy logic, neural networks, evolutionary computation, swarm intelligence, and intelligent agents even before their theoretical foundation is completely understood. And the popularity is rising. Some software vendors have pronounced the new machine learning gold rush to "Transfer Data into Gold". New buzzwords like "data mining", "genetic algorithms", and "swarm optimization" have enriched the top executives' vocabulary to

make them look more "visionary" for the 21st century. The phrase "fuzzy math" became political jargon after being used by US President George W. Bush in one of the election debates in the campaign in 2000. Even process operators are discussing the performance of neural networks with the same passion as the performance of the Dallas Cowboys. However, for most of the engineers and scientists introducing computational intelligence technologies into practice, looking at the growing number of new approaches, and understanding their theoretical principles and potential for value creation becomes a more and more difficult task.

Machine Learning, Optimization, and Big Data Springer

This book addresses optimization in robotics, in terms of both the configuration space and the metal structure of the robot arm itself; and discusses, describes and builds different types of heuristics and algorithms in MATLAB. In addition, the book includes a wealth of examples and exercises. In particular, it enables the reader to write a MATLAB code for all the related problems in robotics. The book also offers detailed descriptions of and builds from scratch several types of optimization algorithms using MATLAB and simplified methods, especially for inverse problems and avoiding singularities. Each chapter features examples and exercises to enhance the reader's comprehension. Accordingly, the book offers the reader a better understanding of robot analysis from an optimization standpoint.

Meta-Heuristics Optimization Algorithms in Engineering, Business, Economics, and Finance Academic Press

This volume constitutes the proceedings of the 6th CCF Conference, Big Data 2018, held in Xi'an, China, in October 2018. The 32 revised full papers presented in this volume were carefully reviewed and selected from 880 submissions. The papers are organized in topical sections on natural language processing and text mining; big data analytics and smart computing; big data applications; the application of big data in machine learning; social networks and recommendation systems; parallel computing and storage of big data; data quality control and data governance; big data system and management.

Handbook of Hydroinformatics Elsevier

Topics in Modal Analysis & Testing, Volume 8: Proceedings of the 40th IMAC, A Conference and Exposition on Structural Dynamics, 2022, the eighth volume of nine from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Modal Analysis, including papers on: Operational Modal & Modal Analysis Applications Experimental Techniques Modal Analysis, Measurements & Parameter Estimation Modal Vectors & Modeling Basics of Modal Analysis Additive Manufacturing & Modal Testing of Printed Parts

Optimization of Type-2 Fuzzy Controllers Using the Bee Colony Algorithm Springer

Metaheuristic algorithms are considered as generic optimization tools that can solve very complex problems characterized by having very large search spaces. Metaheuristic methods reduce the effective size of the search space through the use of effective search strategies. Book Features: Provides a unified view of the most popular metaheuristic methods currently in use Includes the necessary concepts to enable readers to implement and modify already known metaheuristic methods to solve problems Covers design aspects and implementation in MATLAB® Contains numerous examples of problems and solutions that demonstrate the power of these methods of optimization The material has been written from a teaching perspective and, for this reason, this book is primarily intended for undergraduate and postgraduate students of artificial intelligence, metaheuristic methods, and/or evolutionary computation. The objective is to bridge the gap between metaheuristic techniques and complex optimization problems that profit from the convenient properties of metaheuristic approaches. Therefore, engineer practitioners who are not familiar with metaheuristic computation will appreciate that the techniques discussed are beyond simple theoretical tools, since they have been adapted to solve significant problems that commonly arise in such areas.

Metaheuristic Computation with MATLAB® Springer Nature

The need to develop technology and communication necessitates the design of flexible and high-capacity radiating systems in

today's communication infrastructure. In this context, antenna arrays are the ideal solution and have been one of the priority research subjects of the science community dealing with electromagnetics from past to present. Optimization of an array may be performed in various ways such as the optimization of excitation, reflector structure, feed network, etc. depending on the array structure. This book is a collection of seven research studies focused on the optimization of array structures in classical phased array or time modulation, including radiator, reflector, feed network, and radiating element optimizations.

Metaheuristic Optimization: Nature-Inspired Algorithms Swarm and Computational Intelligence, Theory and Applications CRC Press

This book presents selected proceedings of the annual convention of the Computer Society of India. Divided into 10 topical volumes, the proceedings present papers on state-of-the-art research, surveys, and succinct reviews. They cover diverse topics ranging from communications networks to big data analytics, and from system architecture to cyber security. This book focuses on Software Engineering, and informs readers about the state of the art in software engineering by gathering high-quality papers that represent the outcomes of consolidated research and innovations in Software Engineering and related areas. In addition to helping practitioners and researchers understand the chief issues involved in designing, developing, evolving and validating complex software systems, it provides comprehensive information on developing professional careers in Software Engineering. It also provides insights into various research issues such as software reliability, verification and validation, security and extensibility, as well as the latest concepts like component-based development, software process models, process-driven systems and human-computer collaborative systems.

Advances in Array Optimization IGI Global

Swarm intelligence algorithms are a form of nature-based optimization algorithms. Their main inspiration is the cooperative behavior of animals within specific communities. This can be described as simple behaviors of individuals along with the mechanisms for sharing knowledge between them, resulting in the complex behavior of the entire community. Examples of such behavior can be found in ant colonies, bee swarms, schools of fish or bird flocks. Swarm intelligence algorithms are used to solve

difficult optimization problems for which there are no exact solving methods or the use of such methods is impossible, e.g. due to unacceptable computational time. This set comprises two volumes: *Swarm Intelligence Algorithms: A Tutorial and Swarm Intelligence Algorithms: Modifications and Applications*. The first volume thoroughly presents the basics of 24 algorithms selected from the entire family of swarm intelligence algorithms. It contains a detailed explanation of how each algorithm works, along with relevant program codes in Matlab and the C++ programming language, as well as numerical examples illustrating step-by-step how individual algorithms work. The second volume describes selected modifications of these algorithms and presents their practical applications. This book presents 24 swarm algorithms together with their modifications and practical applications. Each chapter is devoted to one algorithm. It contains a short description along with a pseudo-code showing the various stages of its operation. In addition, each chapter contains a description of selected modifications of the algorithm and shows how it can be used to solve a selected practical problem.

Evolutionary Optimization Algorithms Springer

Optimization techniques have developed into a significant area concerning industrial, economics, business, and financial systems. With the development of engineering and financial systems, modern optimization has played an important role in service-centered operations and as such has attracted more attention to this field. Meta-heuristic hybrid optimization is a newly development mathematical framework based optimization technique. Designed by logicians, engineers, analysts, and many more, this technique aims to study the complexity of algorithms and problems. *Meta-Heuristics Optimization Algorithms in Engineering, Business, Economics, and Finance* explores the emerging study of meta-heuristics optimization algorithms and methods and their role in innovated real world practical applications. This book is a collection of research on the areas of meta-heuristics optimization algorithms in engineering, business, economics, and finance and aims to be a comprehensive reference for decision makers, managers, engineers, researchers, scientists, financiers, and economists as well as industrialists.

Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/SIMULINK® Springer Nature

The five-volume set LNCS 7971-7975 constitutes the refereed proceedings of the 13th International Conference on Computational Science and Its Applications, ICCSA 2013, held in Ho Chi Minh City, Vietnam, in June 2013. Apart from the general track, ICCSA 2013 also include 33 special sessions and workshops, in various areas of computational sciences, ranging from computational science technologies, to specific areas of computational sciences, such as computer graphics and virtual reality. There are 46 papers from the general track, and 202 in special sessions and workshops.

Stochastic Global Optimization Methods and Applications to Chemical, Biochemical, Pharmaceutical and Environmental Processes Academic Press

This book presents a wide-ranging review of the latest research and development directions in thermal systems optimization using population-based metaheuristic methods. It helps readers to identify the best methods for their own systems, providing details of mathematical models and algorithms suitable for implementation. To reduce mathematical complexity, the authors focus on optimization of individual components rather than taking on systems as a whole. They employ numerous case studies: heat exchangers; cooling towers; power generators; refrigeration systems; and others. The importance of these subsystems to real-world situations from internal combustion to air-conditioning is made clear. The thermal systems under discussion are analysed using various metaheuristic techniques, with comparative results for different systems. The inclusion of detailed MATLAB® codes in the text will assist readers—researchers, practitioners or students—to assess these techniques for different real-world systems. *Thermal System Optimization* is a useful tool for thermal design researchers and engineers in academia and industry, wishing to perform thermal system identification with properly optimized parameters. It will be of interest for researchers, practitioners and graduate students with backgrounds in mechanical, chemical and power engineering.

Nature-Inspired Metaheuristic Algorithms for Engineering Optimization Applications Elsevier

This book presents select proceedings of the International Conference on Recent Advances in Mechanical Engineering Research and Development (ICRAMERD 2022) focusing on the recent advances and best practices of mechanical engineering,

related technologies and sciences to meet the challenges in mechanical engineering, digital technology and smart manufacturing. The contents focus on design engineering, advanced materials, automation in engineering, industrial and systems engineering, energy and others. Some of the topics discussed here include fracture and failure analysis, fuels and alternative fuels, non-conventional machining, combustion and IC engines, advanced manufacturing technologies, powder metallurgy and rapid prototyping, industrial engineering and automation, supply chain management, design of mechanical systems, vibrations and control engineering, automobile engineering, performance analysis of biomass energy systems, heat transfer, composite materials, thermal modelling and simulations of different systems, analysis of slurry pipeline systems, waste management, optimization and robotics. The wide range of topics presented in this book will be useful for beginners, researchers as well as professionals in mechanical engineering.

Metaheuristic Approaches to Portfolio Optimization

Springer

Introduction to Nature-Inspired Optimization brings together many of the innovative mathematical methods for non-linear optimization that have their origins in the way various species behave in order to optimize their chances of survival. The book describes each method, examines their strengths and weaknesses, and where appropriate, provides the MATLAB code to give practical insight into the detailed structure of these methods and how they work. Nature-inspired algorithms emulate processes that are found in the natural world, spurring interest for optimization. Lindfield/Penny provide concise coverage to all the major algorithms, including genetic algorithms, artificial bee colony algorithms, ant colony optimization and the cuckoo search algorithm, among others. This book provides a quick reference to practicing engineers, researchers and graduate students who work in the field of optimization. - Applies concepts in nature and biology to develop new algorithms for nonlinear optimization - Offers working MATLAB® programs for the major algorithms described, applying them to a range of problems - Provides useful comparative studies of the algorithms, highlighting their strengths and weaknesses - Discusses the current state-of-the-field and indicates possible areas of future development

Numerical Optimization in Engineering and Sciences IGI

Global

Considered one of the most innovative research directions, computational intelligence (CI) embraces techniques that use global search optimization, machine learning, approximate reasoning, and connectionist systems to develop efficient, robust, and easy-to-use solutions amidst multiple decision variables, complex constraints, and tumultuous environments. CI techniques involve a combination of learning, adaptation, and evolution used for intelligent applications. Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/ Simulink® explores the performance of CI in terms of knowledge representation, adaptability, optimality, and processing speed for different real-world optimization problems. Focusing on the practical implementation of CI techniques, this book: Discusses the role of CI paradigms in engineering applications such as unit commitment and economic load dispatch, harmonic reduction, load frequency control and automatic voltage regulation, job shop scheduling, multidepot vehicle routing, and digital image watermarking Explains the impact of CI on power systems, control systems, industrial automation, and image processing through the above-mentioned applications Shows how to apply CI algorithms to constraint-based optimization problems using MATLAB® m-files and Simulink® models Includes experimental analyses and results of test systems Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/ Simulink® provides a valuable reference for industry professionals and advanced undergraduate, postgraduate, and research students. Computational Intelligence for Semantic Knowledge Management BoD - Books on Demand

This book of Springer Nature is another proof of Springer's outstanding and greatness on the lively interface of Smart Computational Optimization, Green ICT, Smart Intelligence and Machine Learning! It is a Master Piece of what our community of academics and experts can provide when an Interconnected Approach of Joint, Mutual and Meta Learning is supported by Modern Operational Research and Experience of the World-Leader Springer Nature! The 5th edition of International Conference on Intelligent Computing and Optimization took place at October 27-28, 2022, via Zoom. Objective was to celebrate "Creativity with Compassion and Wisdom" with researchers, scholars, experts and investigators in Intelligent Computing and

Optimization across the planet, to share knowledge, experience, innovation—a marvelous opportunity for discourse and mutuality by novel research, invention and creativity. This proceedings book of ICO'2022 is published by Springer Nature—Quality Label of wonderful.

Computational Science and Its Applications -- ICCSA 2013

Springer Nature

This book presents and applies a novel efficient meta-heuristic optimization algorithm called Colliding Bodies Optimization (CBO) for various optimization problems. The first part of the book introduces the concepts and methods involved, while the second is devoted to the applications. Though optimal design of structures is the main topic, two chapters on optimal analysis and applications in constructional management are also included. This algorithm is based on one-dimensional collisions between bodies, with each agent solution being considered as an object or body with mass. After a collision of two moving bodies with specified masses and velocities, these bodies again separate, with new velocities. This collision causes the agents to move toward better positions in the search space. The main algorithm (CBO) is internally parameter independent, setting it apart from previously developed meta-heuristics. This algorithm is enhanced (ECBO) for more efficient applications in the optimal design of structures. The algorithms are implemented in standard computer programming languages (MATLAB and C++) and two main codes are provided for ease of use.

Introduction to Nature-Inspired Optimization Springer Nature

This book constitutes revised selected papers from the Second International Workshop on Machine Learning, Optimization, and Big Data, MOD 2016, held in Volterra, Italy, in August 2016. The 40 papers presented in this volume were carefully reviewed and selected from 97 submissions. These proceedings contain papers in the fields of Machine Learning, Computational Optimization and DataScience presenting a substantial array of ideas, technologies, algorithms, methods and applications.

Benchmarks and Hybrid Algorithms in Optimization and Applications CRC Press

Control of an impartial balance between risks and returns has become important for investors, and having a combination of financial instruments within a portfolio is an advantage. Portfolio management has thus become very important for reaching a

resolution in high-risk investment opportunities and addressing the risk-reward tradeoff by maximizing returns and minimizing risks within a given investment period for a variety of assets. Metaheuristic Approaches to Portfolio Optimization is an essential reference source that examines the proper selection of financial instruments in a financial portfolio management scenario in terms of metaheuristic approaches. It also explores common measures used for the evaluation of risks/returns of portfolios in real-life situations. Featuring research on topics such as closed-end funds, asset allocation, and risk-return paradigm, this book is ideally designed for investors, financial professionals, money managers, accountants, students, professionals, and researchers.

Research Advancements in Smart Technology, Optimization, and Renewable Energy Academic Press
Renewable Energy Systems: Modelling, Optimization and Control aims to cross-pollinate recent advances in the study of renewable energy control systems by bringing together diverse scientific breakthroughs on the modeling, control and optimization of renewable energy systems by leading researchers. The book brings together the most comprehensive collection of modeling, control theorems and optimization techniques to help solve many scientific issues for researchers in renewable energy and control engineering. Many multidisciplinary applications are discussed, including new fundamentals, modeling, analysis, design,

realization and experimental results. The book also covers new circuits and systems to help researchers solve many nonlinear problems. This book fills the gaps between different interdisciplinary applications, ranging from mathematical concepts, modeling, and analysis, up to the realization and experimental work. - Covers modeling, control theorems and optimization techniques which will solve many scientific issues for researchers in renewable energy - Discusses many multidisciplinary applications with new fundamentals, modeling, analysis, design, realization and experimental results - Includes new circuits and systems, helping researchers solve many nonlinear problems