

Optimization Engineering Kalavati

For any organization to be successful, it must operate in such a manner that knowledge and information, human resources, and technology are continually taken into consideration and managed effectively. Business concepts are always present regardless of the field or industry – in education, government, healthcare, not-for-profit, engineering, hospitality/tourism, among others. Maintaining organizational awareness and a strategic frame of mind is critical to meeting goals, gaining competitive advantage, and ultimately ensuring sustainability. The Encyclopedia of Organizational Knowledge, Administration, and Technology is an inaugural five-volume publication that offers 193 completely new and previously unpublished articles authored by leading experts on the latest concepts, issues, challenges, innovations, and opportunities covering all aspects of modern organizations. Moreover, it is comprised of content that highlights major breakthroughs, discoveries, and authoritative research results as they pertain to all aspects of organizational growth and development including methodologies that can help companies thrive and analytical tools that assess an organization's internal health and performance. Insights are offered in key topics such as organizational structure, strategic leadership, information technology

management, and business analytics, among others. The knowledge compiled in this publication is designed for entrepreneurs, managers, executives, investors, economic analysts, computer engineers, software programmers, human resource departments, and other industry professionals seeking to understand the latest tools to emerge from this field and who are looking to incorporate them in their practice. Additionally, academicians, researchers, and students in fields that include but are not limited to business, management science, organizational development, entrepreneurship, sociology, corporate psychology, computer science, and information technology will benefit from the research compiled within this publication.

Iris recognition is one of the highest accuracy techniques used in biometric systems. The accuracy of the iris recognition system is measured by False Reject Rate (FRR), which measures the authenticity of a user who is incorrectly rejected by the system due to changes in iris features (such as aging and health condition) and external factors that affect iris image, for instance, high noise rate. External factors such as technical fault, occlusion, and source of lighting that causes the image acquisition to produce distorted iris images create error, hence are incorrectly rejected by the biometric system. FRR can be reduced using wavelets and Gabor filters, cascaded classifiers, ordinal measures, multiple

biometric modalities, and a selection of unique iris features. Nonetheless, in the long duration of the matching process, existing methods were unable to identify the authenticity of the user since the iris structure itself produces a template changed due to aging. In fact, the iris consists of unique features such as crypts, furrows, collarette, pigment blotches, freckles, and pupils that are distinguishable among humans. Earlier research was done by selecting unique iris features. However, these had low accuracy levels. A new way of identifying and matching the iris template using the nature-inspired algorithm is described in this book. It provides an overview of iris recognition that is based on nature-inspired environment technology. The book is useful for students from universities, polytechnics, community colleges; practitioners; and industry practitioners.

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.

The electrical demands in several countries around the world are increasing due to the huge energy requirements of prosperous economies and the

human activities of modern life. In order to economically transfer electrical powers from the generation side to the demand side, these powers need to be transferred at high-voltage levels through suitable transmission systems and power substations. To this end, high-voltage transmission systems and power substations are in demand. Actually, they are at the heart of interconnected power systems, in which any faults might lead to unsuitable consequences, abnormal operation situations, security issues, and even power cuts and blackouts. In order to cope with the ever-increasing operation and control complexity and security in interconnected high-voltage power systems, new architectures, concepts, algorithms, and procedures are essential. This book aims to encourage researchers to address the technical issues and research gaps in high-voltage transmission systems and power substations in modern energy systems. This book, compiles, presents, and explains the most important meta-heuristic and evolutionary optimization algorithms whose successful performance has been proven in different fields of engineering, and it includes application of these algorithms to important engineering optimization problems. In addition, this book guides readers to studies that have implemented these algorithms by providing a literature review on developments and applications of each algorithm. This book is intended

for students, but can be used by researchers and professionals in the area of engineering optimization. This two-volume book presents the outcomes of the 8th International Conference on Soft Computing for Problem Solving, SocProS 2018. This conference was a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), and Vellore Institute of Technology (India), and brought together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions. The book highlights the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers on algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It offers a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems that are difficult to solve using traditional methods.

This volume of Advances in Intelligent Systems and Computing contains accepted papers presented at ICGEC 2014, the 8th International Conference on Genetic and Evolutionary Computing. The

conference this year was technically co-sponsored by Nanchang Institute of Technology in China, Kaohsiung University of Applied Science in Taiwan, and VSB-Technical University of Ostrava. ICGEC 2014 is held from 18-20 October 2014 in Nanchang, China. Nanchang is one of is the capital of Jiangxi Province in southeastern China, located in the north-central portion of the province. As it is bounded on the west by the Jiuling Mountains, and on the east by Poyang Lake, it is famous for its scenery, rich history and cultural sites. Because of its central location relative to the Yangtze and Pearl River Delta regions, it is a major railroad hub in Southern China. The conference is intended as an international forum for the researchers and professionals in all areas of genetic and evolutionary computing.

Predictive Modeling for Energy Management and Power Systems Engineering introduces readers to the cutting-edge use of big data and large computational infrastructures in energy demand estimation and power management systems. The book supports engineers and scientists who seek to become familiar with advanced optimization techniques for power systems designs, optimization techniques and algorithms for consumer power management, and potential applications of machine learning and artificial intelligence in this field. The book provides modeling theory in an easy-to-read format, verified with on-site models and case studies

for specific geographic regions and complex consumer markets. Presents advanced optimization techniques to improve existing energy demand system Provides data-analytic models and their practical relevance in proven case studies Explores novel developments in machine-learning and artificial intelligence applied in energy management Provides modeling theory in an easy-to-read format This volume of the journal contains papers which were presented at the International Conference on Green Trends in Mechanical Engineering Sciences (ICGTMES) that was held on October 3-5, 2018, Karnataka, India. The focus of the conference was to open a new paradigm to deliberate on eco-friendly and robust design, use of materials with less environmental impact, use of fewer materials, optimal utilization of resources during manufacturing processes. We hope that the presented papers will be interesting and useful for many specialists in the field of mechanical engineering and materials science.

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.

Brain and Behavior Computing offers insights into the functions of the human brain. This book provides an emphasis on brain and behavior computing with different modalities available such as signal processing, image processing, data sciences, statistics further it includes fundamental, mathematical model, algorithms, case studies, and future research scopes. It further illustrates brain signal sources and how the brain signal can process, manipulate, and transform in different domains allowing researchers and professionals to extract information about the physiological condition of the brain. Emphasizes real challenges in brain signal processing for a variety of applications for analysis, classification, and clustering. Discusses data sciences and its applications in brain computing visualization. Covers all the most recent tools for analysing the brain and it's working. Describes brain modeling and all possible machine learning methods and their uses. Augments the use of data mining and machine learning to brain computer interface (BCI) devices. Includes case studies and actual simulation examples. This book is aimed at researchers, professionals, and graduate students in image processing and computer vision, biomedical engineering, signal processing, and brain and behavior computing.

This book covers state-of-the-art optimization methods and their applications in wide range especially for researchers and practitioners who wish to improve their

knowledge in this field. It consists of 13 chapters divided into two parts: (I) Engineering applications, which presents some new applications of different methods, and (II) Applications in various areas, where recent contributions of state-of-the-art optimization methods to diverse fields are presented.

This book is primarily intended for undergraduate and postgraduate students of Science, Electrical Engineering, or Computational Mathematics.

Metaheuristic search methods are so numerous and varied in terms of design and potential applications; however, for such an abundant family of optimization techniques, there seems to be a question which needs to be answered: Which part of the design in a metaheuristic algorithm contributes more to its better performance?

Several works that compare the performance among metaheuristic approaches have been reported in the literature. Nevertheless, they suffer from one of the following limitations: (A) Their conclusions are based on the performance of popular evolutionary approaches over a set of synthetic functions with exact solutions and well-known behaviors, without considering the application context or including recent developments. (B) Their conclusions consider only the comparison of their final results which cannot evaluate the nature of a good or bad balance between exploration and exploitation.

The objective of this book is to compare the performance of various metaheuristic techniques when they are faced with complex optimization problems extracted from different engineering domains. The material has been compiled from a teaching perspective.

Operations Research is the discipline of applying advanced analytical methods to help make better decisions. It helps the management to achieve its goals by using scientific techniques, making the study and understanding of operations research even more important in the present day scenario. This book has been written with the objective of providing students with a comprehensive textbook on the subject. It follows a simple algorithmic approach to explain each concept, often giving different steps. This approach stems from the author's experience in teaching undergraduate and postgraduate students of Madras University and Anna University, Chennai, over many years. One of the highlights of this book is the solved-problems approach, as each chapter in the book is substantiated by a large number of solved problems. Many of the questions that have been incorporated are from previous examination papers of various universities. In addition, each chapter has numerous exercise problems at the end and a section on short questions with answers.

The success of any product sold to consumers is based, largely, on the longevity of the product. This concept can be extended by various methods of improvement including optimizing the initial creation structures which can lead to a more desired product and extend the product's time on the market. Design and Optimization of Mechanical Engineering Products is an essential research source that explores the structure and processes used in creating goods and the methods by which these goods are improved in order to continue competitiveness in the consumer market. Featuring

coverage on a broad range of topics including modeling and simulation, new product development, and multi-criteria decision making, this publication is targeted toward students, practitioners, researchers, engineers, and academicians.

This book presents new, alternative metaheuristic developments that have proved to be effective in various complex problems to help researchers, lecturers, engineers, and practitioners solve their own optimization problems. It also bridges the gap between recent metaheuristic techniques and interesting identification system methods that benefit from the convenience of metaheuristic schemes by explaining basic ideas of the proposed applications in ways that can be understood by readers new to these fields. As such it is a valuable resource for energy practitioners who are not researchers in metaheuristics. In addition, it offers members of the metaheuristic community insights into how system identification and energy problems can be translated into optimization tasks.

This two-volume book gathers the proceedings of the Sixth International Conference on Soft Computing for Problem Solving (SocProS 2016), offering a collection of research papers presented during the conference at Thapar University, Patiala, India. Providing a veritable treasure trove for scientists and researchers working in the field of soft computing, it highlights the latest developments in the broad area of “Computational Intelligence” and explores both theoretical and practical aspects using

fuzzy logic, artificial neural networks, evolutionary algorithms, swarm intelligence, soft computing, computational intelligence, etc.

The book discusses advantages of the firefly algorithm over other well-known metaheuristic algorithms in various engineering studies. The book provides a brief outline of various application-oriented problem solving methods, like economic emission load dispatch problem, designing a fully digital controlled reconfigurable switched beam nonconcentric ring array antenna, image segmentation, span minimization in permutation flow shop scheduling, multi-objective load dispatch problems, image compression, etc., using FA and its variants. It also covers the use of the firefly algorithm to select features, as research has shown that the firefly algorithm generates precise and optimal results in terms of time and optimality. In addition, the book also explores the potential of the firefly algorithm to provide a solution to traveling salesman problem, graph coloring problem, etc

In recent years, a lot of work has been done in an effort to incorporate Swarm Intelligence (SI) techniques in building an adaptive routing protocol for Mobile Ad Hoc Networks (MANETs). Since centralized approach for routing in MANETs generally lacks in scalability and fault-tolerance, SI techniques provide a natural solution through a distributed approach for the adaptive routing for

MANETs. In SI techniques, the captivating features of insects or mammals are correlated with the real world problems to find solutions. Recently, several applications of bio-inspired and nature-inspired algorithms in telecommunications and computer networks have achieved remarkable success. The main aims/objectives of this book, "Mobile Ad Hoc Networks: Bio-Inspired Quality of Service Aware Routing Protocols", are twofold; firstly it clearly distinguishes between principles of traditional routing protocols and SI based routing protocols, while explaining in detail the analogy between MANETs and SI principles. Secondly, it presents the readers with important Quality of Service (QoS) parameters and explains how SI based routing protocols achieves QoS demands of the applications. This book also gives quantitative and qualitative analysis of some of the SI based routing protocols for MANETs.

Algal and sustainable technologies: Bioenergy, Nanotechnology and Green chemistry is an interdisciplinary overview of the world's major problems; water scarcity, clean environment and energy and their sustenance remedy measures using microalgae. It comprehensively presents the way to tackle the socio-economic issues including food, feed, fuel, medicine and health and also entails the untapped potential of microalgae in environmental management, bioenergy solution and

sustainable synthesis of pharmaceutical and nutraceutical products. This book basically emphasizes the success of algae as wonderful feed stocks of future and provides upto date information and sustainable and recreational outlook towards degrading environment and energy crisis. Applicability of fast emerging algae based nanotechnology in bioremediation and production of nanoparticle (AuNP, AgNP etc) are beautifully described along with latest research and findings. Key features: The "waste to best to income" strategies are the main concern of the book and take the edge off the problem of pollution, energy and income. Elucidate the sustainable phycoremediation and nanoparticle functions as low cost approach for various ecosystem services. Information regarding pharmaceuticals, nutraceuticals and other algae based value added product synthesis and fate are comprehensively discussed. Knowledge resource, latest research, findings and prospects presented in an accessible manner for researchers, students, eminent scientists, entrepreneurs, professionals and policy maker.

Cognitive Informatics, Computer Modelling, and Cognitive Science: Theory, Case Studies, and Applications presents the theoretical background and history of cognitive science to help readers understand its foundations, philosophical and psychological aspects, and applications in a wide

range of engineering and computer science case studies. Cognitive science, a cognitive model of the brain, knowledge representation, and information processing in the human brain are discussed, as is the theory of consciousness, neuroscience, intelligence, decision-making, mind and behavior analysis, and the various ways cognitive computing is used for information manipulation, processing and decision-making. Mathematical and computational models, structures and processes of the human brain are also covered, along with advances in machine learning, artificial intelligence, cognitive knowledge base, deep learning, cognitive image processing and suitable data analytics.

This book focuses on the toxicity of various organic and inorganic pollutants, their eco-toxicological effects and eco-friendly approaches for remediation of environmental pollutants. Extensive focus has been relied on the recent advances in ecofriendly approaches such as bioremediation and phytoremediation technologies, including the use of various group of microbes for remediation of environmental pollutants, etc. Researchers working in the field of bioremediation, phytoremediation, waste management and related fields will find this compilation most useful for further study to learn about the subject matter.

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

Nature-Inspired Computing: Physics and Chemistry-Based Algorithms provides a comprehensive introduction to the methodologies and algorithms in nature-inspired computing, with an emphasis on applications to real-life engineering problems. The research interest for Nature-inspired Computing has grown considerably exploring different phenomena

observed in nature and basic principles of physics, chemistry, and biology. The discipline has reached a mature stage and the field has been well-established. This endeavour is another attempt at investigation into various computational schemes inspired from nature, which are presented in this book with the development of a suitable framework and industrial applications. Designed for senior undergraduates, postgraduates, research students, and professionals, the book is written at a comprehensible level for students who have some basic knowledge of calculus and differential equations, and some exposure to optimization theory. Due to the focus on search and optimization, the book is also appropriate for electrical, control, civil, industrial and manufacturing engineering, business, and economics students, as well as those in computer and information sciences. With the mathematical and programming references and applications in each chapter, the book is self-contained, and can also serve as a reference for researchers and scientists in the fields of system science, natural computing, and optimization.

Freshwater Microbiology: Perspectives of Bacterial Dynamics in Lake Ecosystems provides a comprehensive and systematic analysis of microbial ecology in lakes. It offers basic information on how well the bacterial community composition varies along the spatio-temporal and trophic gradients

along with the evaluation of the bioindicator species of bacteria so as to act as a key to predict the trophic status of lake ecosystems. The book helps to identify the factors of potential importance in structuring the bacterial communities in lakes as it delves into the dynamics and diversity of bacterial community composition in relation to various water quality parameters. It helps to identify the possibility of bioremediation plans and devising future policy decisions, with better conservation and management practices. Provides a comprehensive and systematic analysis of microbial ecology Helps to identify the factors of potential importance in structuring the bacterial community composition Gives insight into the bacterial diversity of freshwater lake ecosystems along with their industrial potential Caters to the needs and aspirations of students and professional researchers

Swarm Intelligence: Principles, Advances, and Applications delivers in-depth coverage of bat, artificial fish swarm, firefly, cuckoo search, flower pollination, artificial bee colony, wolf search, and gray wolf optimization algorithms. The book begins with a brief introduction to mathematical optimization, addressing basic concepts related to swarm intelligence, such as randomness, random walks, and chaos theory. The text then: Describes the various swarm intelligence optimization methods, standardizing the variants, hybridizations, and

algorithms whenever possible Discusses variants that focus more on binary, discrete, constrained, adaptive, and chaotic versions of the swarm optimizers Depicts real-world applications of the individual optimizers, emphasizing variable selection and fitness function design Details the similarities, differences, weaknesses, and strengths of each swarm optimization method Draws parallels between the operators and searching manners of the different algorithms Swarm Intelligence: Principles, Advances, and Applications presents a comprehensive treatment of modern swarm intelligence optimization methods, complete with illustrative examples and an extendable MATLAB® package for feature selection in wrapper mode applied on different data sets with benchmarking using different evaluation criteria. The book provides beginners with a solid foundation of swarm intelligence fundamentals, and offers experts valuable insight into new directions and hybridizations.

This book presents integrated optimization methods and algorithms for power system problems along with their codes in MATLAB. Providing a reliable and secure power and energy system is one of the main challenges of the new era. Due to the nonlinear multi-objective nature of these problems, the traditional methods are not suitable approaches for solving large-scale power system operation dilemmas. The integration of optimization algorithms into power

systems has been discussed in several textbooks, but this is the first to include the integration methods and the developed codes. As such, it is a useful resource for undergraduate and graduate students, researchers and engineers trying to solve power and energy optimization problems using modern technical and intelligent systems based on theory and application case studies. It is expected that readers have a basic mathematical background. This book presents an interesting sample of the latest advances in optimization techniques applied to electrical power engineering. It covers a variety of topics from various fields, ranging from classical optimization such as Linear and Nonlinear Programming and Integer and Mixed-Integer Programming to the most modern methods based on bio-inspired metaheuristics. The featured papers invite readers to delve further into emerging optimization techniques and their real application to case studies such as conventional and renewable energy generation, distributed generation, transport and distribution of electrical energy, electrical machines and power electronics, network optimization, intelligent systems, advances in electric mobility, etc.

Artificial intelligence (AI) can successfully help in solving real-world problems in power transmission and distribution systems because AI-based schemes are fast, adaptive, and robust and are applicable

without any knowledge of the system parameters. This book considers the application of AI methods for the protection of different types and topologies of transmission and distribution lines. It explains the latest pattern-recognition-based methods as applicable to detection, classification, and location of a fault in the transmission and distribution lines, and to manage smart power systems including all the pertinent aspects. FEATURES Provides essential insight on uses of different AI techniques for pattern recognition, classification, prediction, and estimation, exclusive to power system protection issues Presents an introduction to enhanced electricity system analysis using decision-making tools Covers AI applications in different protective relaying functions Discusses issues and challenges in the protection of transmission and distribution systems Includes a dedicated chapter on case studies and applications This book is aimed at graduate students, researchers, and professionals in electrical power system protection, stability, and smart grids. This book presents the proceedings of the International Conference on Computational Intelligence 2018 (ICCI 2018). It brings together work by leading scientists, researchers and research scholars from around the globe on all aspects of computational intelligence. The work is mainly composed of the original and unpublished results of conceptual, constructive, empirical, experimental, or

theoretical work in all areas of computational intelligence. Specifically, the major topics covered include classical computational intelligence models and artificial intelligence, neural networks and deep learning, evolutionary swarm and particle algorithms, hybrid systems optimization, constraint programming, human–machine interaction, computational intelligence for web analytics, robotics, computational neurosciences, neurodynamics, bioinspired and biomorphic algorithms, cross-disciplinary topics and applications.

This two-volume set (CCIS 951 and CCIS 952) constitutes the proceedings of the 13th International Conference on Bio-inspired Computing: Theories and Applications, BIC-TA 2018, held in Beijing, China, in November 2018. The 88 full papers presented in both volumes were selected from 206 submissions. The papers deal with studies abstracting computing ideas such as data structures, operations with data, ways to control operations, computing models from living phenomena or biological systems such as evolution, cells, neural networks, immune systems, swarm intelligence. This book presents selected extended papers from The First International Conference on Mechanical Engineering (INCOM2018), realized at the Jadavpur University, Kolkata, India. The papers focus on diverse areas of mechanical engineering and some

innovative trends in mechanical engineering design, industrial practices and mechanical engineering education. Original, significant and visionary papers were selected for this edition, specially on interdisciplinary and emerging areas. All papers were peer-reviewed.

This book comprises the select proceedings of the International Conference on Power Engineering Computing and Control (PECCON) 2019. This volume focuses on the different renewable energy sources which are integrated in a smart grid and their operation both in the grid connected mode and islanded mode. The contents highlight the role of power converters in the smart grid environment, battery management, electric vehicular technology and electric charging station as a load for the power network. This book can be useful for beginners, researchers as well as professionals interested in the area of smart grid technology.

This book provides comprehensive details of all Swarm Intelligence based Techniques available till date in a comprehensive manner along with their mathematical proofs. It will act as a foundation for authors, researchers and industry professionals. This monograph will present the latest state of the art research being done on varied Intelligent Technologies like sensor networks, machine learning, optical fiber communications, digital signal processing, image processing and many more.

This book discusses the use of efficient metaheuristic algorithms to solve diverse power system problems, providing an overview of the various aspects of

metaheuristic methods to enable readers to gain a comprehensive understanding of the field and of conducting studies on specific metaheuristic algorithms related to power-system applications. By bridging the gap between recent metaheuristic techniques and novel power system methods that benefit from the convenience of metaheuristic methods, it offers power system practitioners who are not metaheuristic computation researchers insights into the techniques, which go beyond simple theoretical tools and have been adapted to solve important problems that commonly arise. On the other hand, members of the metaheuristic computation community learn how power engineering problems can be translated into optimization tasks, and it is also of interest to engineers and application developers. Further, since each chapter can be read independently, the relevant information can be quickly found. Power systems is a multidisciplinary field that addresses the multiple approaches used for design and analysis in areas ranging from signal processing, and electronics to computational intelligence, including the current trend of metaheuristic computation.

Microbial Wastewater Treatment focuses on the exploitation of microorganisms as decontaminating tools to treat polluted wastewater, a worldwide concern.

Microorganism-based processes are seen as promising technologies to treat the ever-increasing problem of polluted wastewater. The book covers recently developed process technologies to solve five major trends in the field of wastewater treatment, including nutrient removal and recovery, trace organic compounds,

energy saving and production, sustainability and community involvement. Illustrates the importance of microorganisms in wastewater treatment Points out the reuse of the treated wastewater Highlights the recovery of resources from wastewater Pays attention to the occurrence of novel micro-pollutants Introduces new trends in wastewater technology

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