Cuckoo Search Algorithm Based Maximum Power Point Tracking

Rheumatoid Arthritis (RA) falls under the group of chronic autoimmune diseases, which affects the joints and muscles, and can lead to considerable damage to the joint structure and their functionality. RA diagnosis much in early stages is quite critical in stopping the progression of the disease. In this technical work, Dynamic Neutrosophic Cognitive Map with Improved Cuckoo Search Algorithm (DNCM-ICSA) with ensemble classifier is introduced for obtaining the gene expression profile, which distinguishes between the persons affected with RA and probable subjects of control.

The book presents the latest advances and research findings in the fields of computational science and communication. The areas covered include smart innovation; systems and technologies; embedded knowledge and intelligence; innovation and sustainability; advanced computing; and networking and informatics. It also focuses on the knowledge-transfer methodologies and the innovation strategies employed to make these effective. This fascinating compilation appeals to researchers, academics and engineers around the globe. Resource optimization has always been a thrust area of research, and as the Internet of Things (IoT) is the most talked about topic of the current era of technology, it has become the need of the hour. Therefore, the idea behind this book was to simplify the journey of those who aspire to understand resource optimization in the IoT. To this end, included in this book are various real-time/offline applications and algorithms/case studies in the fields of engineering, computer science, information security, and cloud computing, along with the modern tools and various technologies used in systems, leaving the reader with a high level of understanding of various techniques and algorithms used in resource optimization.

The internet of things (IoT) has had a major impact on academic and industrial fields. Applying these technologies to healthcare systems reduces medical costs while enriching the patient-centric approach to medicine, allowing for better overall healthcare proficiency. However, usage of IoT in healthcare is still suffering from significant challenges with respect to the cost and accuracy of medical sensors, non-standard IoT system architectures, assorted wearable devices, the huge volume of generated data, and interoperability issues. Incorporating the Internet of Things in Healthcare Applications and Wearable Devices is an essential publication that examines existing challenges and provides solutions for building smart healthcare systems with the latest IoT-enabled technology and addresses how IoT improves the proficiency of healthcare with respect to wireless sensor networks. While highlighting topics including mobility management, sensor integration, and data analytics, this book is ideally designed for computer scientists, bioinformatics analysts, doctors,

nurses, hospital executives, medical students, IT specialists, software developers, computer engineers, industry professionals, academicians, researchers, and students seeking current research on how these emerging wireless technologies improve efficiency within the healthcare domain.

This book focuses on the use of artificial intelligence to address a specific problem in the brain – the orientation distribution function. It discusses three aspects: (i) Preparing, enhancing and evaluating one of the cuckoo search algorithms (CSA); (ii) Describing the problem: Diffusion-weighted magnetic resonance imaging (DW-MRI) is used for non-invasive investigations of anatomical connectivity in the human brain, while Q-ball imaging (QBI) is a diffusion MRI reconstruction technique based on the orientation distribution function (ODF), which detects the dominant fiber orientations; however, ODF lacks local estimation accuracy along the path. (iii) Evaluating the performance of the CSA versions in solving the ODF problem using synthetic and real-world data. This book appeals to both postgraduates and researchers who are interested in the fields of medicine and computer science.

Standalone (off-grid) renewable energy systems supply electricity in places where there is no access to a standard electrical grid. These systems may include photovoltaic generators, wind turbines, hydro turbines or any other renewable electrical generator. Usually, this kind of system includes electricity storage (commonly lead-acid batteries, but also other types of storage can be used). In some cases, a backup generator (usually powered by fossil fuel, diesel or gasoline) is part of the hybrid system. The modelling of the components, the control of the system and the simulation of the performance of the whole system are necessary to evaluate the system technically and economically. The optimization of the sizing and/or the control is also an important task in this kind of system.

The proceedings present selected research papers from the CIAC2019, held in Jiangsu, China on September 20-22, 2019. It covers a wide range of topics including intelligent control, robotics, artificial intelligence, pattern recognition, unmanned systems, IoT and machine learning. It includes original research and the latest advances in the field of intelligent automation. Engineers and researchers from academia, industry, and government can gain valuable insights into solutions combining ideas from multiple disciplines in this field.

This proceedings book emphasizes adopting artificial intelligence-based and sustainable energy efficiency integrated with clear objectives, to involve researchers, students, and specialists in their development and implementation adequately in achieving objectives. The integration of artificial intelligence into renewable energetic systems would allow the rapid development of a knowledge-based economy suitable to the energy transition, while fully integrating the renewables into the global economy. This is how artificial intelligence has hand in by conceptualizing this transition and above all by saving time. The knowledge economy is valuated within the smart cities, which are fast becoming the favorite

places where the energy transition will take place efficiently and intelligently by implementing integrated approaches to energy saving and energy supply and integrated urban approaches that go beyond individual interventions in buildings or transport modes using information and communication technologies.

This volume contains selected papers presented at the 10th International Conference on Advanced Computing and Communication Technologies (10th ICACCT 2016), technically sponsored by Institution of Electronics and Telecommunication Engineers (India), held during 18 – 20 November 2016 at Asia Pacific Institute of Information Technology, Panipat, India. The volume reports latest research on a wide range of topics spanning theory, system, applications and case studies in the fields of computing and communication technologies. Topics covered are robotics, computational intelligence encompassing fuzzy logic, neural networks, GA and evolutionary computing, applications, knowledge representation, data encryption, distributed computing, data analytics and visualization, knowledge representation, wireless sensor networks, MEM sensor design, analog circuit, statistical machine translation, cellular automata and antenna design. The volume has 31 chapters, including an invited paper on swarm robotics, grouped into three parts, viz., Advanced Computing, Communication Technologies, and Micro Electronics and Antenna Design. The volume is directed to researchers and practitioners aspiring to solve practical issues, particularly applications of the theories of computational intelligence, using recent advances in computing and communication technologies.

This book introduces and analyses the latest maximum power point tracking (MPPT) techniques, which can effectively reduce the cost of power generated from photovoltaic energy systems. It also presents a detailed description, analysis, and comparison of various MPPT techniques applied to stand-alone systems and those interfaced with electric utilities, examining their performance under normal and abnormal operating conditions. These techniques, which and can be conventional or smart, are a current hot topic, and this book is a valuable reference resource for academic researchers and industry professionals who are interested in exploring and implementing advanced MPPT for photovoltaic systems. It is also useful for graduate students who are looking to expand their knowledge of MPPT techniques.

This book presents efficient metaheuristic algorithms for optimal design of structures. Many of these algorithms are developed by the author and his colleagues, consisting of Democratic Particle Swarm Optimization, Charged System Search, Magnetic Charged System Search, Field of Forces Optimization, Dolphin Echolocation Optimization, Colliding Bodies Optimization, Ray Optimization. These are presented together with algorithms which were developed by other authors and have been successfully applied to various optimization problems. These consist of Particle Swarm Optimization, Big Bang-Big Crunch Algorithm, Cuckoo Search Optimization, Imperialist Competitive Algorithm, and Chaos Embedded Metaheuristic Algorithms. Finally a multi-objective optimization method is presented to solve large-scale structural problems based on the Charged System Search algorithm. The concepts and algorithms presented in this book are not only applicable to optimization of skeletal structures and finite element models, but can equally be utilized for optimal design of other systems such as hydraulic and electrical networks. In the second edition seven new chapters are added consisting of the new developments in the field of optimization. These chapters consist of the Enhanced Colliding Bodies Optimization, Global Sensitivity Analysis, Tug of War Optimization, Water Evaporation Optimization, Vibrating Particle System Optimization and Cyclical Parthenogenesis Optimization algorithms. A chapter is also devoted to optimal design of large scale structures.

The contributed volume aims to explicate and address the difficulties and challenges for the seamless integration of two core disciplines of computer science, i.e., computational

intelligence and data mining. Data Mining aims at the automatic discovery of underlying non-trivial knowledge from datasets by applying intelligent analysis techniques. The interest in this research area has experienced a considerable growth in the last years due to two key factors: (a) knowledge hidden in organizations' databases can be exploited to improve strategic and managerial decision-making; (b) the large volume of data managed by organizations makes it impossible to carry out a manual analysis. The book addresses different methods and techniques of integration for enhancing the overall goal of data mining. The book helps to disseminate the knowledge about some innovative, active research directions in the field of data mining, machine and computational intelligence, along with some current issues and applications of related topics.

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

Nature-inspired computation and swarm intelligence have become popular and effective tools for solving problems in optimization, computational intelligence, soft computing and data science. Recently, the literature in the field has expanded rapidly, with new algorithms and applications emerging. Nature-Inspired Computation and Swarm Intelligence: Algorithms, Theory and Applications is a timely reference giving a comprehensive review of relevant state-of-the-art developments in algorithms, theory and applications of nature-inspired algorithms and swarm intelligence. It reviews and documents the new developments, focusing on nature-inspired algorithms and their theoretical analysis, as well as providing a guide to their implementation. The book includes case studies of diverse real-world applications, balancing explanation of the theory with practical implementation. Nature-Inspired Computation and Swarm Intelligence: Algorithms, Theory and Applications is suitable for researchers and graduate students in computer science, engineering, data science, and management science, who want a comprehensive review of algorithms, theory and implementation within the fields of nature inspired computation and swarm intelligence. Introduces nature-inspired algorithms and their fundamentals, including: particle swarm optimization, bat algorithm, cuckoo search, firefly algorithm, flower pollination algorithm, differential evolution and genetic algorithms as well as multi-objective optimization algorithms and others Provides a theoretical foundation and analyses of algorithms, including: statistical theory and Markov chain theory on the convergence and stability of algorithms, dynamical system theory, benchmarking of optimization, no-free-lunch theorems, and a generalized mathematical framework Includes a diversity of case studies of real-world applications: feature selection, clustering and classification, tuning of restricted Boltzmann machines, travelling salesman problem, classification of white blood cells, music generation by artificial intelligence, swarm robots, neural networks, engineering designs and others

We describe in this book, recent developments on fuzzy logic, neural networks and

optimization algorithms, as well as their hybrid combinations, and their application in areas such as, intelligent control and robotics, pattern recognition, medical diagnosis, time series prediction and optimization of complex problems. The book contains a collection of papers focused on hybrid intelligent systems based on soft computing. There are some papers with the main theme of type-1 and type-2 fuzzy logic, which basically consists of papers that propose new concepts and algorithms based on type-1 and type-2 fuzzy logic and their applications. There also some papers that presents theory and practice of meta-heuristics in different areas of application. Another group of papers describe diverse applications of fuzzy logic, neural networks and hybrid intelligent systems in medical applications. There are also some papers that present theory and practice of neural networks in different areas of application. In addition, there are papers that present theory and practice of optimization and evolutionary algorithms in different areas of application. Finally, there are some papers describing applications of fuzzy logic, neural networks and meta-heuristics in pattern recognition problems.

These proceedings gather outstanding research papers presented at the Second International Conference on Data Engineering 2015 (DaEng-2015) and offer a consolidated overview of the latest developments in databases, information retrieval, data mining and knowledge management. The conference brought together researchers and practitioners from academia and industry to address key challenges in these fields, discuss advanced data engineering concepts and form new collaborations. The topics covered include but are not limited to: • Data engineering • Big data • Data and knowledge visualization • Data management • Data mining and warehousing • Data privacy & security • Database theory • Heterogeneous databases • Knowledge discovery in databases • Mobile, grid and cloud computing • Knowledge management • Parallel and distributed data • Temporal data • Web data, services and information engineering • Decision support systems • E-Business engineering and management • E-commerce and e-learning • Geographical information systems • Information management • Information quality and strategy • Information retrieval, integration and visualization • Information security • Information systems and technologies

This book presents efficient metaheuristic algorithms for optimal design of structures. Many of these algorithms are developed by the author and his graduate students, consisting of Particle Swarm Optimization, Charged System Search, Magnetic Charged System Search, Field of Forces Optimization, Democratic Particle Swarm Optimization, Dolphin Echolocation Optimization, Colliding Bodies Optimization, Ray Optimization. These are presented together with algorithms which are developed by other authors and have been successfully applied to various optimization problems. These consist of Partical Swarm Optimization, Big Band Big Crunch algorithm, Cuckoo Search Optimization, Imperialist Competitive Algorithm and Chaos Embedded Metaheuristic Algorithm. Finally a multi-objective Optimization is presented to Solve large scale structural problems based on the Charged System Search algorithm, In the second edition seven new chapters are added consisting of Enhance colliding bodies optimization, Global sensitivity analysis, Tug of War Optimization, Water evaporation optimization, Vibrating System Optimization and Cyclical Parthenogenesis Optimization algorithm. In the third edition, five new chapters are included consisting of the recently developed algorithms. These are Shuffled Shepherd Optimization Algorithm, Set Theoretical Shuffled Shepherd Optimization Algorithm, Set Theoretical Teaching-Learning-Based Optimization Algorithm, Thermal Exchange Metaheuristic Optimization Algorithm, and Water Strider Optimization Algorithm and Its Enhancement. The concepts and algorithm presented in this book are not only applicable to optimization of skeletal structure, finite element models, but can equally be utilized for optimal design of other systems such as hydraulic and electrical networks.

This book contains select green building, materials, and civil engineering papers from the 4th International Conference on Green Building, Materials and Civil Engineering (GBMCE), which

was held in Hong Kong, August 21-22, 2014. This volume of proceedings aims to provide a platform for researchers, engineers, academics, and industry professionals f

This book includes the original, peer-reviewed research papers from the 9th Frontier Academic Forum of Electrical Engineering (FAFEE 2020), held in Xi'an, China, in August 2020. It gathers the latest research, innovations, and applications in the fields of Electrical Engineering. The topics it covers including electrical materials and equipment, electrical energy storage and device, power electronics and drives, new energy electric power system equipment, IntelliSense and intelligent equipment, biological electromagnetism and its applications, and insulation and discharge computation for power equipment. Given its scope, the book benefits all researchers, engineers, and graduate students who want to learn about cutting-edge advances in Electrical Engineering.

The chapters which appear in this volume are selected studies presented at the First International Conference on Engineering and Applied Sciences Optimization (OPT-i), Kos, Greece, 4-6 June 2014 and works written by friends, former colleagues and students of the late Professor M. G. Karlaftis; all in the area of optimization that he loved and published so much in himself. The subject areas represented here range from structural optimization, logistics, transportation, traffic and telecommunication networks to operational research, metaheuristics, multidisciplinary and multiphysics design optimization, etc. This volume is dedicated to the life and the memory of Professor Matthew G. Karlaftis, who passed away a few hours before he was to give the opening speech at OPT-i. All contributions reflect the warmth and genuine friendship which he enjoyed from his associates and show how much his scientific contribution has been appreciated. He will be greatly missed and it is hoped that this volume will be received as a suitable memorial to his life and achievements.

Nature-Inspired Optimization Algorithms provides a systematic introduction to all major nature-inspired algorithms for optimization. The book's unified approach, balancing algorithm introduction, theoretical background and practical implementation, complements extensive literature with well-chosen case studies to illustrate how these algorithms work. Topics include particle swarm optimization, ant and bee algorithms, simulated annealing, cuckoo search, firefly algorithm, bat algorithm, flower algorithm, harmony search, algorithm analysis, constraint handling, hybrid methods, parameter tuning and control, as well as multi-objective optimization. This book can serve as an introductory book for graduates, doctoral students and lecturers in computer science, engineering and natural sciences. It can also serve a source of inspiration for new applications. Researchers and engineers as well as experienced experts will also find it a handy reference. Discusses and summarizes the latest developments in nature-inspired algorithms with comprehensive, timely literature Provides a theoretical understanding as well as practical implementation hints Provides a step-by-step introduction to each algorithm

This book is intended for specialists as well as students and graduate students in the field of artificial intelligence, robotics and information technology. It is will also appeal to a wide range of readers interested in expanding the functionality of artificial intelligence systems. One of the pressing problems of modern artificial intelligence systems is the development of integrated hybrid systems based on deep learning. Unfortunately, there is currently no universal methodology for developing topologies of hybrid neural networks (HNN) using deep learning. The development of such systems calls for the expansion of the use of neural networks (NS) for solving recognition, classification and optimization problems. As such, it is necessary to create a unified methodology for constructing HNN with a selection of models of artificial neurons that make up HNN, gradually increasing the complexity of their structure using hybrid learning algorithms.

This book highlights the basic concepts of the CS algorithm and its variants, and their use in solving diverse optimization problems in medical and engineering applications. Evolutionary-based meta-heuristic approaches are increasingly being applied to solve complicated

optimization problems in several real-world applications. One of the most successful optimization algorithms is the Cuckoo search (CS), which has become an active research area to solve N-dimensional and linear/nonlinear optimization problems using simple mathematical processes. CS has attracted the attention of various researchers, resulting in the emergence of numerous variants of the basic CS with enhanced performance since 2019.

Modern optimization approaches have attracted an increasing number of scientists, decision makers, and researchers. As new issues in this field emerge, different optimization methodologies must be developed and implemented. The Handbook of Research on Emergent Applications of Optimization Algorithms is an authoritative reference source for the latest scholarly research on modern optimization techniques for solving complex problems of global optimization and their applications in economics and engineering. Featuring coverage on a broad range of topics and perspectives such as hybrid systems, non-cooperative games, and cryptography, this publication is ideally designed for students, researchers, and engineers interested in emerging developments in optimization algorithms.

This book presents a detailed description, analysis, comparison of the latest research and developments in photovoltaic energy. Discussing everything from semiconductors to system integration, and applying various advanced technologies to stand alone and electric utility interfaced in normal and abnormal operating conditions of PV systems, this book provides a thorough introduction to the topic. This book brings together research from around the world, covering the use of technologies such as embedded systems, the Internet of things and blockchain technologies for PV systems for different applications including controllers, solar trackers and cooling systems. The book is of interest to electronic and mechanical engineers, researchers and students in the field of photovoltaics.

This book discusses control and optimization techniques in the broadest sense, covering new theoretical results and the applications of newly developed methods for PV systems. Going beyond classical control techniques, it promotes the use of more efficient control and optimization strategies based on linearized models and purely continuous (or discrete) models. These new strategies not only enhance the performance of the PV systems, but also decrease the cost per kilowatt-hour generated.

This edited book presents essential findings in the research fields of artificial intelligence and computer vision, with a primary focus on new research ideas and results for mathematical problems involved in computer vision systems. The book provides an international forum for researchers to summarize the most recent developments and ideas in the field, with a special emphasis on the technical and observational results obtained in the past few years.

This is a reprint in book form of the Energies MDPI Journal Special Issue , entitled "Energy Storage Systems and Power Conversion Electronics for E-Transportation and Smart Grid". The Special Issue was managed by two Guest Editors from Italy and Norway: Professor Sergio Saponara from the University of Pisa and Professor Lucian MIHET-POPA from Østfold University College, in close cooperation with the Editors from Energies. The papers published in this SI are related to the emerging trends in energy storage and power conversion electronic circuits and systems, with a specific focus on transportation electrification, and on the evolution from the electric grid to a smart grid. An extensive exploitation of renewable energy sources is foreseen for the smart grid, as well as a close integration with the energy storage and recharging systems of the electrified transportation era. Innovations at the levels of both algorithmic and hardware (i.e., power converters, electric drives, electronic control units (ECU), energy storage modules and charging stations) are proposed. Research and technology transfer activities in energy storage systems, such as batteries and super/ultra-capacitors, are essential for the success of electric transportation, and to foster the use of renewable energy sources. Energy storage systems are the key technology to solve these issues, and to increase the adoption of renewable energy sources in the smart grid.

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International Conference on Artificial Intelligence in Renewable Energetic Systems, IC-AIRES2019, 26-28 November 2019, Taghit-Bechar, Algeria. The challenges of the energy transition in the medium term lead to numerous technological breakthroughs in the areas of production, optimal distribution and the rational use of energy and renewable energy (energy efficiency and optimization of consumption, massive electrification, monitoring and control energy systems, cogeneration and energy recovery processes, new and renewable energies, etc.). The fall in the cost of renewable energies and the desire for a local control of energy production are today calling for a profound change in the electricity system. Local authorities are at the center of energy developments by taking into account the local nature of certain energy systems, heat networks, geothermal energy, waste heat recovery, and electricity generation from household waste. On the other side, digital sciences are at the heart of connected objects and intelligent products that combine information processing and communication capabilities with their environment. Digital technology is at the center of new systems engineering approaches (3D modeling, virtualization, simulation, digital prototyping, etc.) for the design and development of intelligent systems. The book deals with various topics ranging from the design, development and maintenance of energy production systems, transport, distribution or storage of energy, optimization of energy efficiency, especially in the use of energy. innovation in the fields of energy production from renewable energies, management of energy networks: electricity, fluids, gas, district heating, energy storage modes: battery, super-capacitors , overseeing energy supply through supervision, control and diagnosis, risk management, as well as the design and management of smart grids: microgrid, smartgrid. This imposes the model of energy empowerment in the advent of smart cities. Empower the world's most vulnerable energy-poor citizens and establish growing and vibrant socioeconomic communities, by academics, students in engineering and data computing from around the world who have chosen an academic path leading to an electric power and energy engineering and artificial intelligence to advancing technology for the advantage of humanity. Nature-inspired algorithms such as cuckoo search and firefly algorithm have become popular and widely used in recent years in many applications. These algorithms are flexible, efficient and easy to implement. New progress has been made in the last few years, and it is timely to summarize the latest developments of cuckoo search and firefly algorithm and their diverse applications. This book will review both theoretical studies and applications with detailed algorithm analysis, implementation and case studies so that readers can benefit most from this book. Application topics are contributed by many leading experts in the field. Topics include cuckoo search, firefly algorithm, algorithm analysis, feature selection, image processing, travelling salesman problem, neural network, GPU optimization, scheduling, queuing, multi-objective manufacturing optimization, semantic web service, shape optimization, and others. This book can serve as an ideal reference for both graduates and researchers in computer science, evolutionary computing, machine learning, computational intelligence, and optimization, as well as engineers in business intelligence, knowledge management and information technology.

This book presents recently developed intelligent techniques with applications and theory in the area of engineering management. The involved applications of intelligent techniques such as neural networks, fuzzy sets, Tabu search, genetic algorithms, etc. will be useful for engineering managers, postgraduate students, researchers, and lecturers. The book has been written considering the contents of a classical engineering management book but intelligent techniques are used for handling the engineering management problem areas. This comprehensive characteristics of the book makes it an excellent reference for the solution of complex problems of engineering management. The authors of the chapters are well-known researchers with their previous works in the area of engineering management.

An accessible introduction to metaheuristics and optimization, featuring powerful and modern

algorithms for application across engineering and the sciences From engineering and computer science to economics and management science, optimization is a core component for problem solving. Highlighting the latest developments that have evolved in recent years, Engineering Optimization: An Introduction with Metaheuristic Applications outlines popular metaheuristic algorithms and equips readers with the skills needed to apply these techniques to their own optimization problems. With insightful examples from various fields of study, the author highlights key concepts and techniques for the successful application of commonly-used metaheuristc algorithms, including simulated annealing, particle swarm optimization, harmony search, and genetic algorithms. The author introduces all major metaheuristic algorithms and their applications in optimization through a presentation that is organized into three succinct parts: Foundations of Optimization and Algorithms provides a brief introduction to the underlying nature of optimization and the common approaches to optimization problems, random number generation, the Monte Carlo method, and the Markov chain Monte Carlo method Metaheuristic Algorithms presents common metaheuristic algorithms in detail, including genetic algorithms, simulated annealing, ant algorithms, bee algorithms, particle swarm optimization, firefly algorithms, and harmony search Applications outlines a wide range of applications that use metaheuristic algorithms to solve challenging optimization problems with detailed implementation while also introducing various modifications used for multi-objective optimization Throughout the book, the author presents worked-out examples and real-world applications that illustrate the modern relevance of the topic. A detailed appendix features important and popular algorithms using MATLAB® and Octave software packages, and a related FTP site houses MATLAB code and programs for easy implementation of the discussed techniques. In addition, references to the current literature enable readers to investigate individual algorithms and methods in greater detail. Engineering Optimization: An Introduction with Metaheuristic Applications is an excellent book for courses on optimization and computer simulation at the upper-undergraduate and graduate levels. It is also a valuable reference for researchers and practitioners working in the fields of mathematics, engineering, computer science, operations research, and management science who use metaheuristic algorithms to solve problems in their everyday work.

This book constitutes the refereed proceedings of the Third International Conference on Swarm, Evolutionary, and Memetic Computing, SEMCCO 2012, held in Bhubaneswar, India, in December 2012. The 96 revised full papers presented were carefully reviewed and selected from 310 initial submissions. The papers cover a wide range of topics in swarm, evolutionary, memetic and other intelligent computing algorithms and their real world applications in problems selected from diverse domains of science and engineering.

This book describes recent advances on fuzzy logic, neural networks and optimization algorithms, as well as their hybrid combinations, and their application in areas such as intelligent control and robotics, pattern recognition, medical diagnosis, time series prediction and optimization of complex problems. The book contains a collection of papers focused on hybrid intelligent systems based on soft computing. There are some papers with the main theme of type-1 and type-2 fuzzy logic, which basically consists of papers that propose new concepts and algorithms based on type-1 and type-2 fuzzy logic and their applications. There are also some papers that present theory and practice of meta-heuristics in different areas of application. Another group of papers describes diverse applications of fuzzy logic, neural networks and hybrid intelligent systems in medical applications. There are also some papers that present theory and practice of neural networks in different areas of application. In addition, there are papers that present theory and practice of optimization and evolutionary algorithms in different areas of application. Finally, there are some papers describing applications of fuzzy logic, neural networks and meta-heuristics in pattern recognition problems.

This book constitutes the proceedings of the 12th International Conference On Bio-inspired

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Computing: Theories and Applications, BIC-TA 2017, held in Harbin, China, December 2017. The 50 full papers presented were selected from 143 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, tissues, neural networks, immune systems, and ant colonies.

The cuckoos are the most variable birds in social behavior and parental care: a few cuckoos are among the most social of all birds and rear their young in a common nest; most cuckoos are caring parents that rear their own young with some females laying a few eggs in the nests of others; while many cuckoo species are brood parasites who leave their eggs in the nests of other birds to rear, with their young maturing to kill their foster nestmates. In The Cuckoos, Robert B. Payne presents a new evolutionary history of the family based on molecular genetics, and uses the family tree to explore the origins and diversity of their behaviour. He traces details of the cuckoos' biology to their original sources, includes descriptions of previously unpublished field observations, and reveals new comparisons of songs showing previously overlooked cuckoo species. Lavishly illustrated with specially commissioned colour plates and numerous maps, halftones, and line drawings, The Cuckoos provides the most comprehensive and up-to-date account of this family yet available.

Optimal Power Flow Using FACTS Devices: Soft Computing Techniques develops intelligent algorithms to analyze optimal power flow (OPF) and to enhance the power transfer capability of the transmission line with reduced congestion. By providing elaborate studies on FACTS devices and by using soft computing metaheuristics algorithms such as Firefly, Cuckoo, Flower Pollination, and others., this book enables readers to know about algorithms in real-time power system applications and damping of subsynchronous resonance (SSR) oscillations. Key features of this book include: Offers comprehensive review of FACTS devices and the importance of soft computing techniques for solving OPF. Describes the various problems associated with power system operation and control. Addresses issues of SSR in power systems and proposes soft techniques for SSR analysis in power systems. Demonstrates of the importance of SSR and congestion management using intelligent FACTS devices as part of OPF. Covers power systems' reliability, quality, cost-effectiveness, effects on customer goodwill, and pollution limits, including the deregulation of markets and different intelligent controllers. Optimal Power Flow Using FACTS Devices: Soft Computing Techniques is aimed at researchers and professionals in the field of power systems.