

Access Free Swarm Intelligence And Bio Inspired Computation 14 Modeling To Generate Alternatives Using Biologically Inspired Algorithms Pdf For Free

Bio-inspired Computing: Theories and Applications Jun 29 2022 This book constitutes the proceedings of the 9th International Conference on Bio-inspired Computing: Theories and Applications, BIC-TA 2014, held in Wuhan, China, in October 2014. The 109 revised full papers presented were carefully reviewed and selected from 204 submissions. The papers focus on four main topics, namely evolutionary computing, neural computing, DNA computing, and membrane computing.

Bioinspired Models of Network, Information, and Computing Systems Jun 05 2020 This volume of LNICST is a collection of the papers of the 4th International Conference on Bio-Inspired Models of Network, Information, and Computing Systems (Bionetics). The event took place in the medieval city of Avignon, known also as the City of the Popes, during December 9 to 11, 2009. Bionetics main objective is to bring bio-inspired paradigms into computer engineering and networking, and to enhance the fruitful interactions between these fields and biology. The program of the conference indeed includes applications of various paradigms that have their origin in biology: population dynamics, branching processes, and colony optimization. The proceedings include 19 papers covering a broad range of important issues in areas related to bio-inspired technologies. They correspond to presentations at 6 technical sessions. Four papers correspond to an invited session on the Epidemic-type forwarding in DTNs (sparse mobile ad-hoc wireless networks) organized by Dr Francesco De Pellegrini, (Italy, CREATE-NET). The following 9 papers (selected out of 15 submissions) correspond to contributions to regular sessions on Bio-inspired security, Bio-Inspired Networking, Bioinspired algorithms and software systems. The remaining 6 papers (selected out of a total of 9 submissions) are dedicated to work in progress. For each paper, we have provided at least two independent reviews, most of which were offered by members of the TPC.

Bioinspired Computation in Combinatorial Optimization Feb 23 2022 Bioinspired computation methods such as evolutionary algorithms and ant colony optimization are being applied successfully to complex engineering problems and to problems from combinatorial optimization, and with this comes the requirement to more fully understand the computational complexity of these search heuristics. This is the first textbook covering the most important results achieved in this area. The authors study the computational complexity of bioinspired computation and show how runtime behavior can be analyzed in a rigorous way using some of the best-known combinatorial optimization problems -- minimum spanning trees, shortest paths, maximum matching, covering and scheduling problems. A feature of the book is the separate treatment of single- and multiobjective problems, the latter a domain where the development of the underlying theory seems to be lagging practical successes. This book will be very valuable for teaching courses on bioinspired computation and combinatorial optimization. Researchers will also benefit as the presentation of the theory covers the most important developments in the field over the last 10 years. Finally, with a focus on well-studied combinatorial optimization problems rather than toy problems, the book will also be very valuable for practitioners in this field.

Bio-Inspired and Nanoscale Integrated Computing Mar 15 2021 Brings the latest advances in nanotechnology and biology to computing This pioneering book demonstrates how nanotechnology can create even faster, denser computing architectures and algorithms. Furthermore, it draws from the latest advances in biology with a focus on bio-inspired computing at the nanoscale, bringing to light several new and innovative applications such as nanoscale implantable biomedical devices and neural networks. Bio-Inspired and Nanoscale Integrated Computing features an expert team of interdisciplinary authors who offer readers the benefit of their own breakthroughs in integrated computing as well as a thorough investigation and analyses of the literature. Carefully edited, the book begins with an introductory chapter providing a general overview of the field. It ends with a chapter setting forth the common themes that tie the chapters together as well as a forecast of emerging avenues of research. Among the important topics addressed in the book are modeling of nano devices, quantum computing, quantum dot cellular automata, dielectrophoretic reconfigurable nano architectures, multilevel and three-

dimensional nanomagnetic recording, spin-wave architectures and algorithms, fault-tolerant nanocomputing, molecular computing, self-assembly of supramolecular nanostructures, DNA nanotechnology and computing, nanoscale DNA sequence matching, medical nanorobotics, heterogeneous nanostructures for biomedical diagnostics, biomimetic cortical nanocircuits, bio-applications of carbon nanotubes, and nanoscale image processing. Readers in electrical engineering, computer science, and computational biology will gain new insights into how bio-inspired and nanoscale devices can be used to design the next generation of enhanced integrated circuits.

Bio-Inspired Computing and Networking Oct 22 2021 Seeking new methods to satisfy increasing communication demands, researchers continue to find inspiration from the complex systems found in nature. From ant-inspired allocation to a swarm algorithm derived from honeybees, Bio-Inspired Computing and Networking explains how the study of biological systems can significantly improve computing, networking, and robotics. Containing contributions from leading researchers from around the world, the book investigates the fundamental aspects and applications of bio-inspired computing and networking. Presenting the latest advances in bio-inspired communication, computing, networking, clustering, optimization, and robotics, the book considers state-of-the-art approaches, novel technologies, and experimental studies, including bio-inspired: Optimization of dynamic NP-hard problems Top-down controller design for distributing a robot swarm among multiple tasks Self-organizing data and signals cellular systems Dynamic spectrum access in cognitive radio networks QoS-aware architecture for scalable, adaptive, and survivable network systems Locomotion control of the Hexapod Robot Gregor III The book explores bio-inspired topology control and reconfiguration methods, as well as bio-inspired localization, synchronization, and mobility approaches. Providing wide-ranging coverage that includes past approaches, current challenges, and emerging concepts such as the evolution and self-healing of network architectures and protocols, this comprehensive reference provides you with the well-rounded understanding you need to continue the advancement of the development, design, and implementation of bio-inspired computing and networking.

Swarm Intelligence and Bio-Inspired Computation Dec 04 2022 Swarm Intelligence and bio-inspired computation have become increasingly popular in the last two decades. Bio-inspired algorithms such as ant colony algorithms, bat algorithms, bee algorithms, firefly algorithms, cuckoo search and particle swarm optimization have been applied in almost every area of science and engineering with a dramatic increase of number of relevant publications. This book reviews the latest developments in swarm intelligence and bio-inspired computation from both the theory and application side, providing a complete resource that analyzes and discusses the latest and future trends in research directions. It can help new researchers to carry out timely research and inspire readers to develop new algorithms. With its impressive breadth and depth, this book will be useful for advanced undergraduate students, PhD students and lecturers in computer science, engineering and science as well as researchers and engineers. Focuses on the introduction and analysis of key algorithms Includes case studies for real-world applications Contains a balance of theory and applications, so readers who are interested in either algorithm or applications will all benefit from this timely book.

Bio-Inspired Computation, Algorithms and Its Application to Address Real World Engineering Problems Apr 03 2020

Biologically-Inspired Computing for the Arts: Scientific Data through Graphics May 17 2021 "This book comprises a collection of authors' individual approaches to the relationship between nature, science, and art created with the use of computers, discussing issues related to the use of visual language in communication about biologically-inspired scientific data, visual literacy in science, and application of practitioner's approach"--Provided by publisher.

Computational Vision and Bio-Inspired Computing Feb 11 2021 This book includes selected papers from the 5th International Conference on Computational Vision and Bio Inspired Computing (ICCVBIC 2021), held in Coimbatore, India, during November 25-26, 2021. This book presents state-of-the-art research innovations in computational vision and bio-inspired techniques. The book reveals the theoretical and practical aspects of bio-inspired computing techniques, like machine learning, sensor-based models, evolutionary optimization and big data modeling and management that make use of effectual computing processes in the bio-inspired systems. It also contributes to the novel research that focuses on developing bio-inspired computing solutions for various domains, such as human-computer interaction, image processing, sensor-based single processing, recommender

systems and facial recognition, which play an indispensable part in smart agriculture, smart city, biomedical and business intelligence applications.

Bio-inspired Computation in Unmanned Aerial Vehicles Mar 27 2022 Bio-inspired Computation in Unmanned Aerial Vehicles focuses on the aspects of path planning, formation control, heterogeneous cooperative control and vision-based surveillance and navigation in Unmanned Aerial Vehicles (UAVs) from the perspective of bio-inspired computation. It helps readers to gain a comprehensive understanding of control-related problems in UAVs, presenting the latest advances in bio-inspired computation. By combining bio-inspired computation and UAV control problems, key questions are explored in depth, and each piece is content-rich while remaining accessible. With abundant illustrations of simulation work, this book links theory, algorithms and implementation procedures, demonstrating the simulation results with graphics that are intuitive without sacrificing academic rigor. Further, it pays due attention to both the conceptual framework and the implementation procedures. The book offers a valuable resource for scientists, researchers and graduate students in the field of Control, Aerospace Technology and Astronautics, especially those interested in artificial intelligence and Unmanned Aerial Vehicles. Professor Haibin Duan and Dr. Pei Li, both work at Beihang University (formerly Beijing University of Aeronautics & Astronautics, BUAA). Prof Duan's academic website is: <http://hbduan.buaa.edu.cn>

Bio-Inspired Computational Algorithms and Their Applications Nov 22 2021 Bio-inspired computational algorithms are always hot research topics in artificial intelligence communities. Biology is a bewildering source of inspiration for the design of intelligent artifacts that are capable of efficient and autonomous operation in unknown and changing environments. It is difficult to resist the fascination of creating artifacts that display elements of lifelike intelligence, thus needing techniques for control, optimization, prediction, security, design, and so on. Bio-Inspired Computational Algorithms and Their Applications is a compendium that addresses this need. It integrates contrasting techniques of genetic algorithms, artificial immune systems, particle swarm optimization, and hybrid models to solve many real-world problems. The works presented in this book give insights into the creation of innovative improvements over algorithm performance, potential applications on various practical tasks, and combination of different techniques. The book provides a reference to researchers, practitioners, and students in both artificial intelligence and engineering communities, forming a foundation for the development of the field.

Bio-inspired Computing Machines Jan 13 2021

Nature-Inspired Computing and Optimization Aug 08 2020 The book provides readers with a snapshot of the state of the art in the field of nature-inspired computing and its application in optimization. The approach is mainly practice-oriented: each bio-inspired technique or algorithm is introduced together with one of its possible applications. Applications cover a wide range of real-world optimization problems: from feature selection and image enhancement to scheduling and dynamic resource management, from wireless sensor networks and wiring network diagnosis to sports training planning and gene expression, from topology control and morphological filters to nutritional meal design and antenna array design. There are a few theoretical chapters comparing different existing techniques, exploring the advantages of nature-inspired computing over other methods, and investigating the mixing time of genetic algorithms. The book also introduces a wide range of algorithms, including the ant colony optimization, the bat algorithm, genetic algorithms, the collision-based optimization algorithm, the flower pollination algorithm, multi-agent systems and particle swarm optimization. This timely book is intended as a practice-oriented reference guide for students, researchers and professionals.

Bio-Inspired Computation and Applications in Image Processing Jul 31 2022 Bio-Inspired Computation and Applications in Image Processing summarizes the latest developments in bio-inspired computation in image processing, focusing on nature-inspired algorithms that are linked with deep learning, such as ant colony optimization, particle swarm optimization, and bat and firefly algorithms that have recently emerged in the field. In addition to documenting state-of-the-art developments, this book also discusses future research trends in bio-inspired computation, helping researchers establish new research avenues to pursue. Reviews the latest developments in bio-inspired computation in image processing Focuses on the introduction and analysis of the key bio-inspired methods and techniques Combines theory with real-world applications in image processing Helps solve complex problems in image and signal processing Contains a diverse range of self-contained case studies in real-world applications

Bio-inspired Computing: Theories and Applications Jan 05 2023 This book constitutes the proceedings of the 12th International Conference on Bio-inspired 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.

Innovations in Bio-Inspired Computing and Applications Nov 30 2019 This Volume contains the papers presented during the 6th International Conference on Innovations in Bio-Inspired Computing and Applications IBICA 2015 which was held in Kochi, India during December 16-18, 2015. The 51 papers presented in this Volume were carefully reviewed and selected. The 6th International Conference IBICA 2015 has been organized to discuss the state-of-the-art as well as to address various issues in the growing research field of Bio-inspired Computing which is currently one of the most exciting research areas, and is continuously demonstrating exceptional strength in solving complex real life problems. The Volume will be a valuable reference to researchers, students and practitioners in the computational intelligence field..

Bio-inspired Computing: Theories and Applications Oct 29 2019 This two-volume set (CCIS 1159 and CCIS 1160) constitutes the proceedings of the 14th International Conference on Bio-inspired Computing: Theories and Applications, BIC-TA 2019, held in Zhengzhou, China, in November 2019. The 122 full papers presented in both volumes were selected from 197 submissions. The papers in the two volumes are organized according to the topical headings: evolutionary computation and swarm intelligence; bioinformatics and systems biology; complex networks; DNA and molecular computing; neural networks and artificial intelligence.

New Trends in Computational Vision and Bio-inspired Computing Nov 10 2020 This volume gathers selected, peer-reviewed original contributions presented at the International Conference on Computational Vision and Bio-inspired Computing (ICCVBIC) conference which was held in Coimbatore, India, on November 29-30, 2018. The works included here offer a rich and diverse sampling of recent developments in the fields of Computational Vision, Fuzzy, Image Processing and Bio-inspired Computing. The topics covered include computer vision; cryptography and digital privacy; machine learning and artificial neural networks; genetic algorithms and computational intelligence; the Internet of Things; and biometric systems, to name but a few. The applications discussed range from security, healthcare and epidemic control to urban computing, agriculture and robotics. In this book, researchers, graduate students and professionals will find innovative solutions to real-world problems in industry and society as a whole, together with inspirations for further research.

Bio-Inspired Artificial Intelligence Oct 02 2022 A comprehensive introduction to new approaches in artificial intelligence and robotics that are inspired by self-organizing biological processes and structures. New approaches to artificial intelligence spring from the idea that intelligence emerges as much from cells, bodies, and societies as it does from evolution, development, and learning. Traditionally, artificial intelligence has been concerned with reproducing the abilities of human brains; newer approaches take inspiration from a wider range of biological structures that are capable of autonomous self-organization. Examples of these new approaches include evolutionary computation and evolutionary electronics, artificial neural networks, immune systems, biorobotics, and swarm intelligence to mention only a few. This book offers a comprehensive introduction to the emerging field of biologically inspired artificial intelligence that can be used as an upper-level text or as a reference for researchers. Each chapter presents computational approaches inspired by a different biological system; each begins with background information about the biological system and then proceeds to develop computational models that make use of biological concepts. The chapters cover evolutionary computation and electronics; cellular systems; neural systems, including neuromorphic engineering; developmental systems; immune systems; behavioral systems including several approaches to robotics, including behavior-based, bio-mimetic, epigenetic, and evolutionary robots; and collective systems, including swarm robotics as well as cooperative and competitive co-evolving systems. Chapters end with a concluding overview and suggested reading.

Bio-Inspired Computing: Theories and Applications Sep 28 2019 This two-volume set (CCIS 1565 and CCIS 1566) constitutes selected and revised papers from the 16th International Conference on Bio-Inspired Computing: Theories and Applications, BIC-TA 2021, held in Taiyuan, China, in December 2021. The 67 papers presented were thoroughly reviewed and selected from 211 submissions. The papers are organized in the following topical

sections: evolutionary computation and swarm intelligence; DNA and molecular computing; machine learning and computer vision.

Innovations in Bio-Inspired Computing and Applications Jul 07 2020 This book highlights recent research on bio-inspired computing and its various innovative applications in information and communication technologies. It presents 51 high-quality papers from the 11th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2020) and 10th World Congress on Information and Communication Technologies (WICT 2020), which was held online during December 16–18, 2019. As a premier conference, IBICA–WICT brings together researchers, engineers and practitioners whose work involves bio-inspired computing, computational intelligence and their applications in information security, real-world contexts, etc. Including contributions by authors from 25 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Bio-Inspired Artificial Intelligence Aug 27 2019 A comprehensive introduction to new approaches in artificial intelligence and robotics that are inspired by self-organizing biological processes and structures. New approaches to artificial intelligence spring from the idea that intelligence emerges as much from cells, bodies, and societies as it does from evolution, development, and learning. Traditionally, artificial intelligence has been concerned with reproducing the abilities of human brains; newer approaches take inspiration from a wider range of biological structures that are capable of autonomous self-organization. Examples of these new approaches include evolutionary computation and evolutionary electronics, artificial neural networks, immune systems, biorobotics, and swarm intelligence—to mention only a few. This book offers a comprehensive introduction to the emerging field of biologically inspired artificial intelligence that can be used as an upper-level text or as a reference for researchers. Each chapter presents computational approaches inspired by a different biological system; each begins with background information about the biological system and then proceeds to develop computational models that make use of biological concepts. The chapters cover evolutionary computation and electronics; cellular systems; neural systems, including neuromorphic engineering; developmental systems; immune systems; behavioral systems—including several approaches to robotics, including behavior-based, bio-mimetic, epigenetic, and evolutionary robots; and collective systems, including swarm robotics as well as cooperative and competitive co-evolving systems. Chapters end with a concluding overview and suggested reading.

Bio-Inspired Computational Intelligence and Applications Dec 12 2020 This book is part of a two-volume work that constitutes the refereed proceedings of the International Conference on Life System Modeling and Simulation, LSMS 2007, held in Shanghai, China, September 2007. Coverage includes advanced neural network theory, advanced evolutionary computing theory, ant colonies and particle swarm optimization, intelligent modeling, monitoring, and control of complex nonlinear systems, as well as biomedical signal processing, imaging and visualization.

Bio-Inspired Computing for Information Retrieval Applications Sep 20 2021 The growing presence of biologically-inspired processing has caused significant changes in data retrieval. With the ubiquity of these technologies, more effective and streamlined data processing techniques are available. Bio-Inspired Computing for Information Retrieval Applications is a key resource on the latest advances and research regarding current techniques that have evolved from biologically-inspired processes and its application to a variety of problems. Highlighting multidisciplinary studies on data processing, swarm-based clustering, and evolutionary computation, this publication is an ideal reference source for researchers, academics, professionals, students, and practitioners.

Bio-Inspired Computing and Applications Sep 01 2022 The three-volume set LNCS 6838, LNAI 6839, and LNBI 6840 constitutes the thoroughly refereed post-conference proceedings of the 7th International Conference on Intelligent Computing, ICIC 2011, held in Zhengzhou, China, in August 2011. This volume contains 93 revised full papers, from a total of 281 presentations at the conference - carefully reviewed and selected from 832 initial submissions. The papers address all issues in Advanced Intelligent Computing, especially Methodologies and Applications, including theories, methodologies, and applications in science and technology. They include a range of techniques such as artificial intelligence, pattern recognition, evolutionary computing, informatics theories and applications, computational neuroscience and bioscience, soft computing, human computer interface issues, etc.

Bio-Inspired Computing: Theories and Applications Jan 01 2020 This two-volume set (CCIS 1565 and CCIS 1566) constitutes selected and revised papers from the 16th International Conference on Bio-Inspired Computing:

Theories and Applications, BIC-TA 2021, held in Taiyuan, China, in December 2021. The 67 papers presented were thoroughly reviewed and selected from 211 submissions. The papers are organized in the following topical sections: evolutionary computation and swarm intelligence; DNA and molecular computing; machine learning and computer vision.

Nature-Inspired Computation in Data Mining and Machine Learning Jan 31 2020 This book reviews the latest developments in nature-inspired computation, with a focus on the cross-disciplinary applications in data mining and machine learning. Data mining, machine learning and nature-inspired computation are current hot research topics due to their importance in both theory and practical applications. Adopting an application-focused approach, each chapter introduces a specific topic, with detailed descriptions of relevant algorithms, extensive literature reviews and implementation details. Covering topics such as nature-inspired algorithms, swarm intelligence, classification, clustering, feature selection, cybersecurity, learning algorithms over cloud, extreme learning machines, object categorization, particle swarm optimization, flower pollination and firefly algorithms, and neural networks, it also presents case studies and applications, including classifications of crisis-related tweets, extraction of named entities in the Tamil language, performance-based prediction of diseases, and healthcare services. This book is both a valuable reference resource and a practical guide for students, researchers and professionals in computer science, data and management sciences, artificial intelligence and machine learning.

Computational Vision and Bio-Inspired Computing Dec 24 2021 This book includes selected papers from the 4th International Conference on Computational Vision and Bio Inspired Computing (ICCVBIC 2020), held in Coimbatore, India, from November 19 to 20, 2020. This proceedings book presents state-of-the-art research innovations in computational vision and bio-inspired techniques. The book reveals the theoretical and practical aspects of bio-inspired computing techniques, like machine learning, sensor-based models, evolutionary optimization and big data modeling and management that make use of effectual computing processes in the bio-inspired systems. As such it contributes to the novel research that focuses on developing bio-inspired computing solutions for various domains, such as human-computer interaction, image processing, sensor-based single processing, recommender systems and facial recognition, which play an indispensable part in smart agriculture, smart city, biomedical and business intelligence applications.

Bio-Inspired Computation in Telecommunications Nov 03 2022 Bio-inspired computation, especially those based on swarm intelligence, has become increasingly popular in the last decade. Bio-Inspired Computation in Telecommunications reviews the latest developments in bio-inspired computation from both theory and application as they relate to telecommunications and image processing, providing a complete resource that analyzes and discusses the latest and future trends in research directions. Written by recognized experts, this is a must-have guide for researchers, telecommunication engineers, computer scientists and PhD students.

Innovations in Bio-Inspired Computing and Applications Aug 20 2021 This book highlights recent research on bio-inspired computing and its various innovative applications in information and communication technologies. It presents 51 high-quality papers from the 11th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2020) and 10th World Congress on Information and Communication Technologies (WICT 2020), which was held online during December 16-18, 2019. As a premier conference, IBICA-WICT brings together researchers, engineers and practitioners whose work involves bio-inspired computing, computational intelligence and their applications in information security, real-world contexts, etc. Including contributions by authors from 25 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Bio-Inspired Computing: Theories and Applications Oct 10 2020 This volume constitutes the revised selected papers of the 15th International Conference on Bio-inspired Computing: Theories and Applications, BIC-TA 2020, held in Qingdao, China, in October 2020. The 43 full papers presented in both volumes were selected from 109 submissions. The papers are organized according to the topical headings: evolutionary computation and swarm intelligence; neural networks and machine learning; DNA computing and membrane computing.

Biological Computation Mar 03 2020 The area of biologically inspired computing, or biological computation, involves the development of new, biologically based techniques for solving difficult computational problems. A unified overview of computer science ideas inspired by biology, Biological Computation presents the most

fundamental and significant concepts in this area. In the book, students discover that bacteria communicate, that DNA can be used for performing computations, how evolution solves optimization problems, that the way ants organize their nests can be applied to solve clustering problems, and what the human immune system can teach us about protecting computer networks. The authors discuss more biological examples such as these, along with the computational techniques developed from these scenarios. The text focuses on cellular automata, evolutionary computation, neural networks, and molecular computation. Each chapter explores the biological background, describes the computational techniques, gives examples of applications, discusses possible variants of the techniques, and includes exercises and solutions. The authors use the examples and exercises to illustrate key ideas and techniques. Clearly conveying the essence of the major computational approaches in the field, this book brings students to the point where they can either produce a working implementation of the techniques or effectively use one of the many available implementations. Moreover, the techniques discussed reflect fundamental principles that can be applied beyond bio-inspired computing. Supplementary material is available on Dr. Unger's website.

Bio-inspired Computing Models And Algorithms May 29 2022 Bio-inspired computing (BIC) focuses on the designs and developments of computer algorithms and models based on biological mechanisms and living phenomena. It is now a major subfield of natural computation that leverages on the recent advances in computer science, biology and mathematics. The ideas provide abundant inspiration to construct high-performance computing models and intelligent algorithms, thus enabling powerful tools to solve real-life problems. Written by world-renowned researchers, this compendium covers the most influential topics on BIC, where the newly-obtained algorithms, developments and results are introduced and elaborated. The potential and valuable directions for further research are addressed as well.

Innovations in Bio-Inspired Computing and Applications Jul 19 2021 This book highlights recent research on bio-inspired computing and its various innovative applications in information and communication technologies. It presents 80 high-quality papers from the 12th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2021) and 11th World Congress on Information and Communication Technologies (WICT 2021), which was held online during December 16–18, 2021. As a premier conference, IBICA–WICT brings together researchers, engineers and practitioners whose work involves bio-inspired computing, computational intelligence and their applications in information security, real-world contexts, etc. Including contributions by authors from 25 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Bio-inspired Algorithms for the Vehicle Routing Problem Apr 27 2022 The vehicle routing problem (VRP) is one of the most famous combinatorial optimization problems. In simple terms, the goal is to determine a set of routes with overall minimum cost that can satisfy several geographical scattered demands. Biological inspired computation is a field devoted to the development of computational tools modeled after principles that exist in natural systems. The adoption of such design principles enables the production of problem solving techniques with enhanced robustness and flexibility, able to tackle complex optimization situations. The goal of the volume is to present a collection of state-of-the-art contributions describing recent developments concerning the application of bio-inspired algorithms to the VRP. Over the 9 chapters, different algorithmic approaches are considered and a diverse set of problem variants are addressed. Some contributions focus on standard benchmarks widely adopted by the research community, while others address real-world situations.

Bio-inspired Computing: Theories and Applications Apr 15 2021 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.

Nature-Inspired Optimization Algorithms Sep 08 2020 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

Proceedings of the Fifth International Conference on Innovations in Bio-Inspired Computing and Applications IBICA 2014 May 05 2020 This volume of Advances in Intelligent Systems and Computing contains accepted papers presented at IBICA2014, the 5th International Conference on Innovations in Bio-inspired Computing and Applications. The aim of IBICA 2014 was to provide a platform for world research leaders and practitioners, to discuss the full spectrum of current theoretical developments, emerging technologies, and innovative applications of Bio-inspired Computing. Bio-inspired Computing remains to be one of the most exciting research areas, and it is continuously demonstrating exceptional strength in solving complex real life problems. The main driving force of the conference was to further explore the intriguing potential of Bio-inspired Computing. IBICA 2014 was held in Ostrava, Czech Republic and hosted by the VSB - Technical University of Ostrava.

Bio-Inspired Computing and Communication Jan 25 2022 The book constitutes the thoroughly refereed post-workshop proceedings of the First Workshop on Bio-Inspired Design of Networks, BOWIRE 2007, held in Cambridge, UK, in April 2007. The 35 revised full papers presented were carefully reviewed and selected from many high quality submissions. All recent developments in the field of bio-inspired design of networks are addressed, with particular regard to wireless networks and the self-organizing properties of biological networks. The papers are organized in topical sections on biological networks, network epidemics, complex networks, bio-inspired network mode, network protocol in wireless communication, data management, distributed computing, and security.

Bio-inspired Computing – Theories and Applications Jun 17 2021 The two-volume set, CCIS 681 and CCIS 682, constitutes the proceedings of the 11th International Conference on Bio-Inspired Computing: Theories and Applications, BIC-TA 2016, held in Xi'an, China, in October 2016. The 115 revised full papers presented were carefully reviewed and selected from 343 submissions. The papers of Part I are organized in topical sections on DNA Computing; Membrane Computing; Neural Computing; Machine Learning. The papers of Part II are organized in topical sections on Evolutionary Computing; Multi-objective Optimization; Pattern Recognition; Others.