

The seven-volume set LNCS 12137, 12138, 12139, 12140, 12141, 12142, and 12143 constitutes the proceedings of the 20th International Conference on Computational Science, ICCS 2020, held in Amsterdam, The Netherlands, in June 2020.* The total of 101 papers and 248 workshop papers presented in this book set were carefully reviewed and selected from 719 submissions (230 submissions to the main track and 489 submissions to the workshops). The papers were organized in topical sections named: Part I: ICCS Main Track Part II: ICCS Main Track Part III: Advances in High-Performance Computational Earth Sciences: Applications and Frameworks: Agent-Based Simulations, Adaptive Algorithms and Solvers; Applications of Computational Methods in Artificial Intelligence and Machine Learning; Biomedical and Bioinformatics Challenges for Computer Science Part IV: Classifier Learning from Difficult Data; Complex Social Systems through the Lens of Computational Science; Computational Health; Computational Methods for Emerging Problems in (Dis-)Information Analysis Part V: Computational Optimization, Modelling and Simulation; Computational Science in IoT and Smart Systems; Computer Graphics, Image Processing and Artificial Intelligence Part VI: Data Driven Computational Sciences; Machine Learning and Data Assimilation for Dynamical Systems; Meshfree Methods in Computational Sciences; Multiscale Modelling and Simulation; Quantum Computing Workshop Part VII: Simulations of Flow and Transport: Modeling, Algorithms and Computation; Smart Systems: Bringing Together Computer Vision, Sensor Networks and Machine Learning; Software Engineering for Computational Science; Solving Problems with Uncertainties; Teaching Computational Science; UNcErtaInty QUantification for Computational models *The conference was canceled due to the COVID-19 pandemic.

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

Nature-Inspired Optimization AlgorithmsElsevier

Mathematical Foundations of Nature-Inspired Algorithms

AI and Machine Learning Paradigms for Health Monitoring System

Nature-Inspired Computing and Optimization

Nature-Inspired Computation and Swarm Intelligence

Swarm Intelligence Algorithms (Two Volume Set)

The two-volume set LNAI 10841 and LNAI 10842 constitutes the refereed proceedings of the 17th International Conference on Artificial Intelligence and Soft Computing, ICAISC 2018, held in Zakopane, Poland in June 2018. The 140 revised full papers presented were carefully reviewed and selected from 242 submissions. The papers included in the first volume are organized in the following three parts: neural networks and their applications; evolutionary algorithms and their applications; and pattern classification.

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 is a collection of accepted papers that were presented at the International Conference on Communication and Computing Systems (ICCCS-2016), Dronacharya College of Engineering, Gurgaon, September 9–11, 2016. The purpose of the conference was to provide a platform for interaction between scientists from industry, academia and other areas of society to discuss the current advancements in the field of communication and computing systems. The papers submitted to the proceedings were peer-reviewed by 2-3 expert referees. This volume contains 5 main subject areas: 1. Signal and Image Processing, 2. Communication & Computer Networks, 3. Soft Computing, Intelligent System, Machine Vision and Artificial Neural Network, 4. VLSI & Embedded System, 5. Software Engineering and Emerging Technologies.

This book embodies principles and applications of advanced soft computing approaches in engineering, healthcare and allied domains directed toward the researchers aspiring to learn and apply intelligent data analytics techniques. The first part covers AI, machine learning and data analytics tools and techniques and their applications to the class of several hospital and health real-life problems. In the later part, the applications of AI, ML and data analytics shall be covered over the wide variety of applications in hospital, health, engineering and/or applied sciences such as the clinical services, medical image analysis, management support, quality analysis, bioinformatics, device analysis and operations. The book presents knowledge of experts in the form of chapters with the objective to introduce the theme of intelligent data analytics and discusses associated theoretical applications. At last, it presents simulation codes for the problems included in the book for better understanding for beginners.

This book highlights the analytics and optimization issues in healthcare systems, proposes new approaches, and presents applications of innovative approaches in real facilities. In the past few decades, there has been an exponential rise in the application of swarm intelligence techniques for solving complex and intricate problems arising in healthcare. The versatility of these techniques has made them a favorite among scientists and researchers working in diverse areas. The primary objective of this book is to bring forward thorough, in-depth, and well-focused developments of hybrid variants of swarm intelligence algorithms and their applications in healthcare systems.

21st International Conference, Cagliari, Italy, September 13–16, 2021, Proceedings, Part V

Proceedings of the 10th International Conference on Computing and Information Technology (IC2IT2014)

20th International Conference, Amsterdam, The Netherlands, June 3–5, 2020, Proceedings, Part III

Intelligent Data Analytics

Engineering Design Optimization

Recent Advances in Information and Communication Technology

Mit diesem Buch soll aufgezeigt werden, wie von der Natur inspirierte Berechnungen eine praktische Anwendung im maschinellen Lernen finden, damit wir ein besseres Verständnis für die Welt um uns herum entwickeln. Der Schwerpunkt liegt auf der Darstellung und Präsentation aktueller Entwicklungen in den Bereichen, in denen von der Natur inspirierte Algorithmen speziell konzipiert und angewandt werden, um komplexe reale Probleme in der Datenanalyse und Mustererkennung zu lösen. Mit einer detaillierten Beschreibung verschiedener, von der Natur inspirierter Algorithmen und ihrer multidisziplinären Anwendung (beispielsweise in Maschinenbau und Elektrotechnik, beim maschinellen Lernen, in der Bildverarbeitung, beim Data Mining und in Drahtlosnetzwerken) ist dieses Buch ein praktisches Nachschlagewerk.

First International Conference, ICCI 2009, Wroclaw, Poland, October 5-7, 2009, Proceedings

Nature-Inspired Optimization Algorithms

Swarm Intelligence Algorithms

Evolutionary Optimization Algorithms

Nature-Inspired Algorithms and Applications

Artificial Intelligence in Healthcare