

1. Record Nr.	UNINA9910819902003321
Titolo	Bio-inspired computation in telecommunications // edited by Xin-She Yang, Su Fong Chien, Tiew On Ting
Pubbl/distr/stampa	Waltham, Massachusetts : , : Morgan Kaufmann, , 2015 ©2015
ISBN	0-12-801743-0 0-12-801538-1
Edizione	[First edition.]
Descrizione fisica	1 online resource (349 p.)
Disciplina	621.382
Soggetti	Telecommunication Biologically-inspired computing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Bio-Inspired Computation in Telecommunications; Copyright ; Contents ; Preface ; List of Contributors ; Chapter 1: Bio-Inspired Computation and Optimization: An Overview; 1.1. Introduction; 1.2. Telecommunications and optimization; 1.3. Key challenges in optimization; 1.3.1. Infinite Monkey Theorem and Heuristicity; 1.3.2. Efficiency of an Algorithm; 1.3.3. How to Choose Algorithms; 1.3.4. Time Constraints; 1.4. Bio-inspired optimization algorithms; 1.4.1. SI-Based Algorithms; 1.4.1.1. Ant and bee algorithms; 1.4.1.2. Bat algorithm; 1.4.1.3. Particle swarm optimization 1.4.1.4. Firefly algorithm1.4.1.5. Cuckoo search; 1.4.2. Non-SI-Based Algorithms; 1.4.2.1. Simulated annealing; 1.4.2.2. Genetic algorithms; 1.4.2.3. Differential evolution; 1.4.2.4. Harmony search; 1.4.3. Other Algorithms; 1.5. Artificial neural networks; 1.5.1. Basic Idea; 1.5.2. Neural Networks; 1.5.3. Back Propagation Algorithm; 1.6. Support vector machine; 1.6.1. Linear SVM; 1.6.2. Kernel Tricks and Nonlinear SVM; 1.7. Conclusions; References; Chapter 2: Bio-Inspired Approaches in Telecommunications; 2.1. Introduction; 2.2. Design problems in telecommunications; 2.3. Green communications 2.3.1. Energy Consumption in Wireless Communications2.3.2. Metrics for Energy Efficiency; 2.3.3. Radio Resource Management; 2.3.4. Strategic Network Deployment; 2.4. Orthogonal frequency division

multiplexing; 2.4.1. OFDM Systems; 2.4.2. Three-Step Procedure for Timing and Frequency Synchronization; 2.5. OFDMA model considering energy efficiency and quality-of-service; 2.5.1. Mathematical Formulation; 2.5.2. Results; 2.6. Conclusions; References; Chapter 3: Firefly Algorithm in Telecommunications; 3.1. Introduction; 3.2. Firefly algorithm; 3.2.1. Algorithm Complexity; 3.2.2. Variants of Firefly Algorithm; 3.3. Traffic Characterization; 3.3.1. Network Management Based on Flow Analysis and Traffic Characterization; 3.3.2. Firefly Harmonic Clustering Algorithm; 3.3.3. Results; 3.4. Applications in wireless cooperative networks; 3.4.1. Related Work; 3.4.2. System Model and Problem Statement; 3.4.2.1. Energy and spectral efficiencies; 3.4.2.2. Problem statement; 3.4.3. Dinkelbach Method; 3.4.4. Firefly Algorithm; 3.4.5. Simulations and Numerical Results; 3.5. Concluding remarks; 3.5.1. FA in Traffic Characterization; 3.5.2. FA in Cooperative Networks; References Chapter 4: A Survey of Intrusion Detection Systems Using Evolutionary Computation; 4.1. Introduction; 4.2. Intrusion detection systems; 4.2.1. IDS Components; 4.2.2. Research Areas and Challenges in Intrusion Detection; 4.3. The method: evolutionary computation; 4.4. Evolutionary computation applications on intrusion detection; 4.4.1. Foundations; 4.4.2. Data Collection; 4.4.3. Detection Techniques and Response; 4.4.3.1. Intrusion detection on conventional networks; 4.4.3.2. Intrusion detection on wireless and resource-constrained networks; 4.4.4. IDS Architecture; 4.4.5. IDS Security; 4.4.6. Testing and Evaluation

Sommario/riassunto

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.
