Swarm Intelligence for Electric and Electronic Engineering

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With growing developments in artificial intelligence and focus on swarm behaviors; algorithms have been utilized in solving a variety of problems in the field of engineering. This approach has been specifically suited to face the challenges in electric and electronic engineering.

Swarm Intelligence for Electric and Electronic Engineering provides an exchange of knowledge on the advances, discoveries, and improvements of swarm intelligence in electric and electronic engineering. This comprehensive collection aims to bring together new swarm-based algorithms as well as approaches to complex problems and various real-world applications.

Topics Covered:

- Bio-inspired Hardware and Networks
- Circuit, Filter and network synthesis
- Decision making and Control in industrial environment
- Diagnosis in industrial processes
- Pattern recognition and signal processing
- Power systems
- Sensor networks
- Telecommunications systems
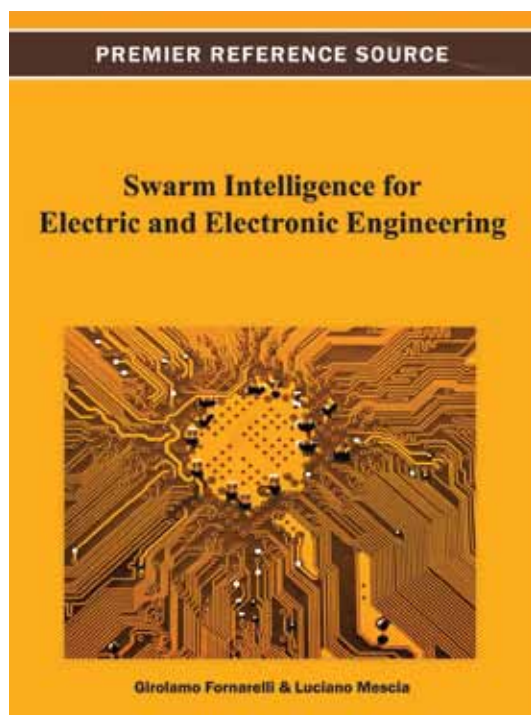
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Market: This premier publication is essential for all academic and research library reference collections. It is a crucial tool for academicians, researchers, and practitioners and is ideal for classroom use.

Girolamo Fornarelli received his Master's degree in Electronic Engineer and the Ph.D. degree in Electrical Engineer from the Politecnico di Bari where at present, he is Assistant Professor in the Circuit Theory group. He taught "Circuit Simulation" and "Fundamentals of Electric Circuits" at the I and II Faculty of Engineering and concurrently he teaches "Electrotechnics" at the I Faculty of Engineering. He serves as reviewer for many international conferences and journals, as well as chairman, organizer of the special sessions and a member of the international program committee at international conferences. His most research interests deal with analysis of non-linear circuits, theoretical aspects for the development of neural networks, application of artificial neural networks and soft computing methods to clustering and non-destructive evaluation of industrial products and installations. Moreover, he works in the field of evolutionary computational, in detail such studies are related the characterization, optimization and design of neural circuits and optical fibres.

Section 1: Circuit Design

Chapter 1
Design and Optimization of Microwave Circuits and Devices with the Particle Swarm Optimizer
Donelli Massimo (University of Trento, Italy)

Chapter 2
Microwave Circuit Design
Cormier Gabriel (Université de Moncton, Canada)
Ross Tyler (Carleton University, Canada)

Chapter 3
MO-TRIBES for the Optimal Design of Analog Filters
Fakhfakh Mourad (University of Sfax, Tunisia)
Siarry Patrick (University of Paris-Est Créteil, France)

Chapter 4
Design Automation, Modeling, Optimization, and Testing of Analog/RF Circuits and Systems by Particle Swarm Optimization
Tripathi Jai Narayan (IIT Bombay, India)
Mukherjee Jayanta (IIT Bombay, India)
Apte Prakash R. (IIT Bombay, India)

Section 2: Antenna and Optical Devices

Chapter 5
Particle Swarm Optimization Algorithm in Electromagnetics- Case Studies:
Modiri Arezoo (University of Texas at Dallas, USA)
Kiasaleh Kamran (University of Texas at Dallas, USA)

Chapter 6
Particle Swarm Optimization Algorithms Applied to Antenna and Microwave Design Problems
Goudos Sotirios K. (Aristotle University of Thessaloniki, Greece)
Zaharis Zaharias D. (Aristotle University of Thessaloniki, Greece)
Baltzis Konstantinos B. (Aristotle University of Thessaloniki, Greece)

Chapter 7
Optimum Design and Characterization of Rare Earth-Doped Fibre Amplifiers by Means of Particle Swarm Optimization Approach
Fornarelli Girolamo (Politecnico di Bari, Italy)
Giaquinto Antonio (Politecnico di Bari, Italy)
Mescia Luciano (Politecnico di Bari, Italy)

Chapter 8
Optimum Design of Hybrid EDFA/FRA by Particle Swarm Optimization
Mowla Alireza (K.N. Toosi University of Technology, Iran)
Granpayeh Nosrat (K.N. Toosi University of Technology, Iran)
Hormozi Azadeh Rastegari (K.N. Toosi University of Technology, Iran)

Section 3: Control Optimization

Chapter 9
Distributed Task Allocation in Swarms of Robots
Jevtić Aleksandar (Robosoft, France)
Andina Diego (E.T.S.I.T.-Universidad Politécnica de Madrid, Ciudad Universitaria, Spain)
Jamshidi Mo (University of Texas, USA)

Chapter 10
Using Swarm Intelligence for Optimization of Parameters in Approximations of Fractional-Order Operators
Maione Guido (Technical University of Bari, Italy)
Punzi Antonio (Technical University of Bari, Italy)
Li Kang (Queen's University of Belfast, UK)

Chapter 11
Optimal Location of the Workpiece in a PKM-based Machining Robotic Cell
Pires E.J. Solteiro (Universidade de Trás-os-Montes e Alto Douro, Portugal)
Lopes António M. (Universidade do Porto, Portugal)
Machado J. A. Tenreiro (Instituto Politécnico do Porto, Portugal)
Oliveira P. B. de Moura (Universidade de Trás-os-Montes e Alto Douro, Portugal)

Chapter 12
The Generalized Particle Swarm Optimization Algorithm:
Kanović Željko S. (University of Novi Sad, Serbia)
Rapaić Milan R. (University of Novi Sad, Serbia)
Jeličić Zoran D. (University of Novi Sad, Serbia)

Section 4: Scheduling and Diagnosis

Chapter 13
Transmission Expansion Planning by using DC and AC Models and Particle Swarm Optimization
Torres Santiago P. (University of Campinas (UNICAMP), Brazil)
Castro Carlos A. (University of Campinas (UNICAMP), Brazil)
Rider Marcos J. (São Paulo State University (UNESP), Brazil)

Chapter 14
Short-Term Generation Scheduling Solved with a Particle Swarm Optimizer
Mateus Víctor Hugo Hinojosa (Universidad Técnica Federico Santa María, Chile)
Rojas Cristhoper Leyton (Universidad Técnica Federico Santa María, Chile)

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Nondestructive Analysis of Dielectric Bodies by Means of an Ant Colony Optimization Method
Pastorino Matteo (University of Genoa, Italy)
Randazzo Andrea (University of Genoa, Italy)

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The Use of Evolutionary Algorithm-Based Methods in EEG Based BCI Systems
Atyabi Adham (Flinders University, Australia)
Luerssen Martin (Flinders University, Australia)
Fitzgibbon Sean P (Flinders University, Australia)
Powers David M W (Flinders University, Australia)