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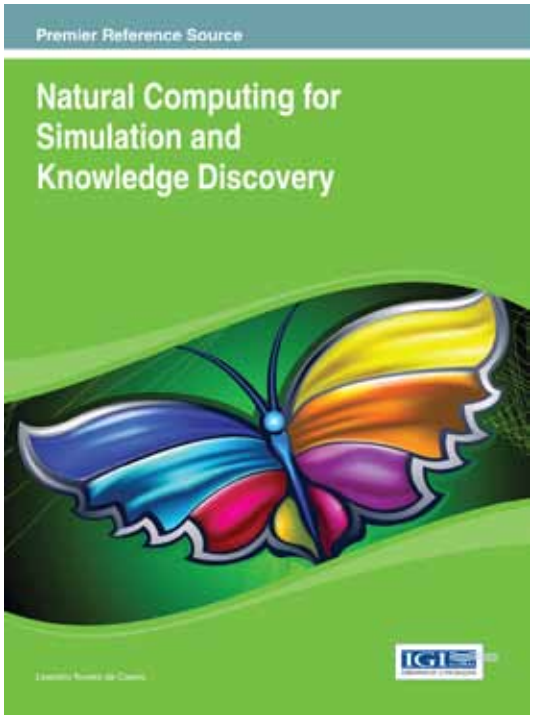
Natural Computing for Simulation and Knowledge Discovery



Leandro Nunes de Castro
(Mackenzie University, Brazil)

Nature has long provided the inspiration for a variety of scientific discoveries in engineering, biomedicine, and computing, though only recently have these elements of nature been used directly in computational systems.

Natural Computing for Simulation and Knowledge Discovery investigates the latest developments in nature-influenced technologies. Within its pages, readers will find an in-depth analysis of such advances as cryptographic solutions based on cell division, the creation and manipulation of biological computers, and particle swarm optimization techniques. Scientists, practitioners, and students in fields such as computing, mathematics, and molecular science will make use of this essential reference to explore current trends in natural computation and advance nature-inspired technologies to the next generation.

Topics Covered:

- Biological Computing
- Evolutionary Algorithms
- Information Processing
- Machine Learning
- Membrane Computing
- Particle Swarm Optimization
- Robot Locomotion
- Transportation

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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. Ideal for classroom use.

Leandro Nunes de Castro received a BSc degree in electrical engineering from the Federal University of Goias (Brazil, 1996) and MSc and PhD degrees in computer engineering from the State University of Campinas (Unicamp) (São Paulo, Brazil) in 1998 and 2001, respectively. He received a MBA (2007) in strategic business management from the Catholic University of Santos. He was a research associate with the Computing Laboratory at UKC (Canterbury, UK) from 2001 to 2002, a visiting lecturer at Unicamp from 2002 to 2003, a senior research fellow at the Wernher von Braun Center for Advanced Research from May to December 2004, and a visiting lecturer at the Universiti Technologi Malaysia (Johor, MY) in September 2005. In May 2003, he joined the Catholic University of Santos (UniSantos) as an assistant professor in computer science and established collaborations with the Federal University of Bahia (UFBA) and the Federal University of Minas Gerais (UFMG). Leandro is currently an associate professor at Mackenzie University. He has broad interest in all natural computing approaches with a particular emphasis on biologically inspired computing including artificial immune systems, artificial neural networks, evolutionary algorithms, swarm intelligence, fractal geometry, and artificial life. He is the main author of *Artificial Immune Systems: A New Computational Intelligence Approach* published by Springer-Verlag (UK, 2002), one of the editors of *Recent Developments in Biologically Inspired Computing* published by Idea Group Inc. (USA, 2004), and the author of *Fundamentals of Natural Computing: Basic Concepts, Algorithms, and Applications* published by CRC Press LLC (June 2006). He has published over seventy-five conference papers, twenty journal papers and six book chapters mostly covering natural computing approaches. He has been a member of the IEEE Computational Intelligence Society since 1999, ICARIS (International Conference on Artificial Immune Systems) Steering Committee since 2003, the Brazilian Society for Automation (SBA) since 1998, and the Brazilian Computing Society (SBC) since 2006. In February 2007 he started a company on natural computing, named "NatComp – from Nature to Business", which he is the Director of Research, Development, and Innovation (RDI).

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