Table of Contents

Foreword .................................................................................................................................................. xvii

Preface .................................................................................................................................................... xix

Chapter 1
Biologically Inspired Techniques for Data Mining: A Brief Overview of Particle Swarm Optimization for KDD .............................................................................................................................. 1
  Shafiq Alam, University of Auckland, New Zealand
  Gillian Dobbie, University of Auckland, New Zealand
  Yun Sing Koh, University of Auckland, New Zealand
  Saeed ur Rehman, Unitec Institute of Technology, New Zealand

Chapter 2
Probabilistic Control and Swarm Dynamics in Mobile Robots and Ants ............................................. 11
  Eugene Kagan, The Weizmann Institute of Science, Israel
  Alexander Rybalov, Jerusalem College of Technology, Israel
  Alon Sela, Tel-Aviv University, Israel
  Hava Siegelmann, University of Massachusetts at Amherst, USA
  Jennie Steshenko, University of Massachusetts at Amherst, USA

Chapter 3
A Measure Optimized Cost-Sensitive Learning Framework for Imbalanced Data Classification .......... 48
  Peng Cao, Northeastern University, China & University of Alberta, Canada
  Osmar Zaiane, University of Alberta, Canada
  Dazhe Zhao, Northeastern University, China

Chapter 4
Towards an Improved Ensemble Learning Model of Artificial Neural Networks: Lessons Learned on Using Randomized Numbers of Hidden Neurons ............................................................................ 76
  Fatai Anifowose, Universiti Malaysia Sarawak, Malaysia
  Jane Labadin, Universiti Malaysia Sarawak, Malaysia
  Abdulazez Abdulraheem, King Fahd University of Petroleum and Minerals, Saudi Arabia
Chapter 5
Ant Programming Algorithms for Classification
Juan Luis Olmo, University of Córdoba, Spain
José Raúl Romero, University of Córdoba, Spain
Sebastián Ventura, University of Córdoba, Spain

Chapter 6
Machine Fault Diagnosis and Prognosis using Self-Organizing Map
Kesheng Wang, NTNU, Norway
Zhenyou Zhang, NTNU, Norway
Yi Wang, University of Manchester, UK

Chapter 7
An Enhanced Artificial Bee Colony Optimizer for Predictive Analysis of Heating Oil Prices using Least Squares Support Vector Machines
Zuriani Mustaffa, Universiti Utara Malaysia (UUM), Malaysia
Yuhanis Yusof, Universiti Utara Malaysia (UUM), Malaysia
Siti Sakira Kamaruddin, Universiti Utara Malaysia (UUM), Malaysia

Chapter 8
Comparison of Linguistic Summaries and Fuzzy Functional Dependencies Related to Data Mining
Miroslav Hudec, University of Economics in Bratislava, Slovakia
Miljan Vučetić, University of Belgrade, Serbia
Mirko Vujošević, University of Belgrade, Serbia

Chapter 9
Application of Artificial Neural Network and Genetic Programming in Civil Engineering
Pijush Samui, VIT University, India
Dhruvan Choubisa, VIT University, India
Akash Sharda, VIT University, India

Chapter 10
A Promising Direction towards Automatic Construction of Relevance Measures
Lucianne Varn, Independent Researcher, New Zealand
Kourosh Neshatian, University of Canterbury, New Zealand

Chapter 11
Adaptive Scheduling for Real-Time Distributed Systems
Apurva Shah, The M. S. University of Baroda, India
Chapter 12
Discovery of Emergent Sorting Behavior using Swarm Intelligence and Grid-Enabled Genetic Algorithms ........................................................................................................................................... 249
Dimitris Kalles, Hellenic Open University, Greece
Alexis Kaporis, University of the Aegean, Greece
Vassiliki Mperoukli, Hellenic Open University, Greece
Anthony Chatzinouskas, Hellenic Open University, Greece

Chapter 13
Application of Biologically Inspired Techniques for Industrial and Environmental Research via Air Quality Monitoring Network ........................................................................................................................................... 272
Tianxing Cai, Lamar University, USA

Chapter 14
Online Prediction of Blood Glucose Levels using Genetic Algorithm ........................................................................................................................................... 299
Khaled Eskaf, Arab Academy for Science, Technology and Maritime Transport, Egypt
Tim Ritchings, University of Salford, UK
Osama Bedawy, Arab Academy for Science, Technology and Maritime Transport, Egypt

Chapter 15
Security of Wireless Devices using Biological-Inspired RF Fingerprinting Technique ........................................................................................................................................... 311
Saeed ur Rehman, Unitec Institute of Technology, New Zealand
Shafiq Alam, University of Auckland, New Zealand
Iman T. Ardekani, Unitec Institute of Technology, New Zealand

Compilation of References ........................................................................................................................................... 331

About the Contributors ........................................................................................................................................... 365

Index ........................................................................................................................................... 374