# Artificial Intelligence and Integrated Intelligent Information Systems: Emerging Technologies and Applications

## Table of Contents

Foreword.................................................................................................................................................... vii
Preface........................................................................................................................................................... ix

### Section I: Emerging Intelligent Technologies and Applications

#### Chapter I
**Human-Based Models for Ambient Intelligence Environments** ................................................. 1
  Giovanni Acampora, Università degli Studi di Salerno, Italy
  Vincenzo Loia, Università degli Studi di Salerno, Italy
  Michele Nappi, Università degli Studi di Salerno, Italy
  Stefano Ricciardi, Università degli Studi di Salerno, Italy

#### Chapter II
**Intelligent Ant Colony System for Traveling Salesman Problem and Clustering.** ......................................................... 18
  Shu-Chuan Chu, Cheng Shiu University, Taiwan
  Jeng-Shyang Pan, Kaohsiung University of Applied Sciences, Taiwan, & Harbin Institute of Technology, China

#### Chapter III
**Information Networks as Complex Systems: A Self-Repair and Regulation Model** ................................................. 43
  Yoshiteru Ishida, Toyohashi University of Technology, Japan
Chapter IV
Soft Statistical Decision Fusion for Distributed Medical Data on Grids ........................ 59
Yu Tang, Georgia State University, USA
Yan-Qing Zhang, Georgia State University, USA

Section II:
Hybrid Intelligent Systems and Applications

Chapter V
Designing Layers in Hierarchial Fuzzy Logic Systems Using Genetic Algorithms
Masoud Mohammadian, University of Canberra, Australia
Russel Stonier, Central Queensland University, Australia

Chapter VI
Intelligent Text Mining: Putting Evolutionary Methods and Language Technologies Together
John Atkinson, Universidad de Concepción, Chile

Chapter VII
An Evolutionary Framework for Nonlinear Time-Series Prediction with Adaptive Gated Mixtures of Experts
André L. V. Coelho, University of Fortaleza (Unifor), Brazil
Clodoaldo A. M. Lima, State University of Campinas (Unicamp), Brazil
Fernando J. Von Zuben, State University of Campinas (Unicamp), Brazil

Chapter VIII
Applications of Artificial Intelligence in the Process Control of Electro Chemical Discharge Machining (ECDM)
T. K. K. R. Mediliyegedara, Glasgow Caledonian University, UK
A. K. M. De Silva, Glasgow Caledonian University, UK
D. K. Harrison, Glasgow Caledonian University, UK
J. A. McGeough, The University of Edinburgh, UK

Section III:
Innovative Intelligent Computing, Information, and Control

Chapter IX
Neural Networks and 3D Edge Genetic Template Matching for Real-Time Face Detection and Recognition
Stephen Karungaru, University of Tokushima, Japan
Minoru Fukumi, University of Tokushima, Japan
Norio Akamatsu, University of Tokushima, Japan
Chapter X  
Colored Local Invariant Features for Distinct Object Description 
in Vision-Based Intelligent Systems .................................................. 178  
Alaa E. Abdel-Hakim, University of Louisville, USA  
Aly A. Farag, University of Louisville, USA

Chapter XI  
Automated Object Detection and Tracking for 
Intelligent Visual Surveillance Based on Sensor Network ...................... 206  
Ruth Aguilar-Ponce, University of Louisiana - Lafayette, USA  
Ashok Kumar, University of Louisiana - Lafayette, USA  
J. Luis Tecpanecatl-Xihuitl, University of Louisiana - Lafayette, USA  
Magdy Bayoumi, University of Louisiana - Lafayette, USA  
Mark Radle, University of Louisiana - Lafayette, USA

Chapter XII  
Fuzzy Coach-Player System for Controlling a Robot Manipulator .......... 229  
Chandimal Jayawardena, Saga University, Japan  
Keigo Watanabe, Saga University, Japan  
Kiyotaka Izumi, Saga University, Japan

Section IV:  
Modeling and Development of Intelligent Information Systems

Chapter XIII  
Multi-Level Modeling of Multi-Mobile Agent Systems ...................... 252  
Ernesto López-Mellado, CINVESTAV Unidad Guadalajara, Mexico

Chapter XIV  
Development of an Intelligent Information System  
for Object-Oriented Software Design .................................................. 273  
Gary P. Moynihan, The University of Alabama, USA  
Bin Qiao, The University of Alabama, USA  
Matthew E. Elam, The University of Alabama, USA  
Joel Jones, The University of Alabama, USA

Chapter XV  
An Agent Based Formal Approach for Modeling and Verifying 
Integrated Intelligent Information Systems ........................................... 287  
Leandro Dias da Silva, Federal University of Campina Grande, Brazil  
Elthon Allex da Silva Oliveira, Federal University of Campina Grande, Brazil  
Hyggo Almeida, Federal University of Campina Grande, Brazil  
Angelo Perkusich, Federal University of Campina Grande, Brazil
Chapter XVI
Intelligent Remote Monitoring and Maintenance Systems

Chengliang Liu, Shanghai JiaoTong University, China
Xuan F. Zha, National Institute of Standards and Technology,
University of Maryland, USA & Shanghai JiaoTong University, China

Section V:
Integrated Intelligent Product Design and Development

Chapter XVII
An Integrated Intelligent System Model and Its Applications
in Virtual Product Design and Development

Xuan F. Zha, National Institute of Standards and Technology,
University of Maryland, USA & Shanghai JiaoTong University, China

Chapter XVIII
Document-Driven Design for Distributed CAD Services

Yan Wang, University of Central Florida, USA

Chapter XIX
Towards a Design Process for Integrating Product
Recommendation Services in E-Markets

Nikos Manouselis, Informatics Laboratory,
Agricultural University of Athens, Greece
Constantina Costopoulou, Informatics Laboratory,
Agricultural University of Athens, Greece

Chapter XX
A Stage Model for NPD Process Maturity and IKMS Implementation

Nassim Belbaly, UCLA Anderson Business School of Management, USA
Hind Benbya, UCLA Anderson Business School of Management, USA

About the Authors

Index