



Editorial.

#### Computational Intelligence in Remote Sensing: An Editorial

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Abstract: Computational intelligence is a very active and fruitful research of artificial intelligence with a broad spectrum of applications. Remote sensing data has been a salient field of application of computational intelligence algorithms, both for the exploitation of the data and for the research/development of new data analysis tools. In this editorial paper we provide the setting of the special issue "Computational Intelligence in Remote Sensing" and an overview of the published papers. The 11 accepted and published papers cover a wide spectrum of applications and computational tools that we try to summarize and put in perspective in this editorial paper.

Keywords: Hyperspectral images, radar, computational intelligence, remote sensing, evolutionary computation, feature extraction, classification

#### 1. Introduction

The appearance of new and more powerful remote sensing technologies has produced a surge of remote sensing data to be processed for a variety of applications in the natural sciences, such as agriculture, forestry or ecological monitoring, and others, such as the automotive industry. This special issue contains a broad sample of such applications, including indoor crowd detection and localization by means of anonymous and non invasive sensors [1]; applications in the automotive industry, such as the detection of the incoming obstacles/vehicles by on-board radar [2], and the detection of highly contaminant vehicles [3]; land cover segmentation for several purposes, such as ecological monitoring [4,5], and land uses [6,7].

The surging abundance of data has been accompanied by a blooming of computational resources and methods for analysis, such as evolutionary and random search algorithms, particle swarm optimization (PSO) [7], and ant colony optimization (ACO) [8], which are often extended as multi-objective optimization algorithms. Computational intelligence tools are increasingly being used for pre-processing, enhancement, classification, and construction of thematic maps, change detection, target detection, sub-pixel resolution analysis, and other general processes. The renaissance of artificial neural networks, with the resurgence of deep learning approaches, has injected new vitality in various research fields that deal with remote sensing data analysis, but also classical approaches such as cellular automata [6] have a renewed application value.

Of paramount importance for the development of reproducible science is the availability of data repositories and open source codes that may be used by researchers across the world to confirm or

**VM** Jensen

Computational Intelligence for Remote Sensing Manuel Grana, Richard J. Duro, 2008-06-05 This book is a composition of different points of view regarding the application of Computational Intelligence techniques and methods to Remote Sensing data and applications It is the general consensus that classification its related data processing and global optimization methods are core topics of Computational Intelligence Much of the content of the book is devoted to image segmentation and recognition using diverse tools from different areas of the Computational Intelligence field ranging from Artificial Neural Networks to Markov Random Field modeling The book covers a broad range of topics starting from the hardware design of hyperspectral sensors and data handling problems namely data compression and watermarking issues as well as autonomous web services The main contents of the book are devoted to image analysis and efficient parallel implementations of these analysis techniques The classes of images dealt with throughout the book are mostly multispectral hyperspectral images though there are some instances of processing Synthetic Aperture Radar images Computational Intelligence and Proceedings of International Conference on Computational Intelligence and Intelligent Systems Zhenhua Li,2009-10-05 Data Engineering Nabendu Chaki, Agostino Cortesi, Nagaraju Devarakonda, 2017-12-19 The book presents high quality research work in cutting edge technologies and most happening areas of computational intelligence and data engineering It contains selected papers presented at International Conference on Computational Intelligence and Data Engineering ICCIDE 2017 The conference was conceived as a forum for presenting and exchanging ideas and results of the researchers from academia and industry onto a common platform and help them develop a comprehensive understanding of the challenges of technological advancements from different viewpoints This book will help in fostering a healthy and vibrant relationship between academia and industry. The topics of the conference include but are not limited to collective intelligence intelligent transportation systems fuzzy systems Bayesian network ant colony optimization data privacy and security data mining data warehousing big data analytics cloud computing natural language processing swarm intelligence and speech processing

Computational Intelligence, Data Analytics and Applications Fausto Pedro García Márquez, Akhtar Jamil, Süleyman Eken, Alaa Ali Hameed, 2023-03-14 This book is a compilation of accepted papers presented at the International Conference on Computing Intelligence and Data Analytics ICCIDA in 2022 organized by Information Systems Engineering of the Kocaeli University Turkey on September 16 17 2022 The book highlights some of the latest research advances and cutting edge analyses of real world problems related to Computing Intelligence and Data Analytics and their applications in various domains This includes state of the art models and methods used on benchmark datasets **Computational Intelligence for Pattern Recognition** Witold Pedrycz, Shyi-Ming Chen, 2018-04-30 The book presents a comprehensive and up to date review of fuzzy pattern recognition It carefully discusses a range of methodological and algorithmic issues as well as implementations and case studies and identifies the best design practices assesses business models and practices of pattern

recognition in real world applications in industry health care administration and business Since the inception of fuzzy sets fuzzy pattern recognition with its methodology algorithms and applications has offered new insights into the principles and practice of pattern classification Computational intelligence CI establishes a comprehensive framework aimed at fostering the paradigm of pattern recognition The collection of contributions included in this book offers a representative overview of the advances in the area with timely in depth and comprehensive material on the conceptually appealing and practically sound methodology and practices of CI based pattern recognition **Handbook of Research on Computational** Intelligence for Engineering, Science, and Business Bhattacharyya, Siddhartha, Dutta, Paramartha, 2012-11-30 Using the same strategy for the needs of image processing and pattern recognition scientists and researchers have turned to computational intelligence for better research throughputs and end results applied towards engineering science business and financial applications Handbook of Research on Computational Intelligence for Engineering Science and Business discusses the computation intelligence approaches initiatives and applications in the engineering science and business fields This reference aims to highlight computational intelligence as no longer limited to computing related disciplines and can be applied to any effort which handles complex and meaningful information Computational Intelligence Paradigms L. C. Jain, 2008-06-12 This book features research on the innovative applications of advanced computational intelligence paradigms Coverage includes architectures of computational intelligence paradigms knowledge discovery pattern classification and Soft Computing for Hybrid Intelligent Systems Oscar Castillo, Patricia Melin, Witold gene linkage analysis Pedrycz, 2008-08-25 We describe in this book new methods and applications of hybrid intelligent systems using soft computing techniques Soft Computing SC consists of several intelligent computing paradigms including fuzzy logic neural networks and evolutionary all rithms which can be used to produce powerful hybrid intelligent systems. The book is organized in five main parts which contain a group of papers around a similar subject The first part consists of papers with the main theme of intelligent control which are basically papers that use hybrid systems to solve particular problems of control The second part contains papers with the main theme of pattern recognition which are basically papers using soft computing techniques for achieving pattern recognition in different applications. The third part contains papers with the themes of intelligent agents and social systems which are papers that apply the ideas of agents and social behavior to solve real world problems The fourth part contains papers that deal with the hardware implementation of intelligent systems for solving particular problems The fifth part contains papers that deal with modeling simulation and optimization for real world applications **Differential Evolution in Electromagnetics** Anyong Qing, Ching Kwang Lee, 2010-05-28 Differential evolution has proven itself a very simple while very powerful stochastic global optimizer It has been applied to solve problems in many scientific and engineering fields This book focuses on applications of differential evolution in electromagnetics to showcase its achievement and capability in solving synthesis and design problems in electromagnetics

Topics covered in this book include A comprehensive up to date literature survey on differential evolution A systematic description of differential evolution A topical review on applications of differential evolution in electromagnetics Five new application examples This book is ideal for electromagnetic researchers and people in differential evolution community It is also a valuable reference book for researchers and students in the optimization or electrical and electronic engineering field In addition managers and engineers in relevant fields will find it a helpful introductory guide \*\*Emerging Research in Artificial Intelligence and Computational Intelligence Jingsheng Lei, Fu Lee Wang, Hepu Deng, Duoqian Miao, 2012-10-05 This book constitutes the refereed proceedings of the International Conference on Artificial Intelligence and Computational Intelligence AICI 2012 held in Chengdu China in October 2012 The 163 revised full papers presented were carefully reviewed and selected from 724 submissions The papers are organized in topical sections on applications of artificial intelligence applications of computational intelligence data mining and knowledge discovering evolution strategy intelligent image processing machine learning neural networks pattern recognition

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