

Advances in Intelligent Systems and Computing

Volume 737

Series editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland
e-mail: kacprzyk@ibspan.waw.pl

About this Series

The series “Advances in Intelligent Systems and Computing” contains publications on theory, applications, and design methods of Intelligent Systems and Intelligent Computing. Virtually all disciplines such as engineering, natural sciences, computer and information science, ICT, economics, business, e-commerce, environment, healthcare, life science are covered. The list of topics spans all the areas of modern intelligent systems and computing.

The publications within “Advances in Intelligent Systems and Computing” are primarily textbooks and proceedings of important conferences, symposia and congresses. They cover significant recent developments in the field, both of a foundational and applicable character. An important characteristic feature of the series is the short publication time and world-wide distribution. This permits a rapid and broad dissemination of research results.

Advisory Board

Chairman

Nikhil R. Pal, Indian Statistical Institute, Kolkata, India

e-mail: nikhil@isical.ac.in

Members

Rafael Bello Perez, Universidad Central “Marta Abreu” de Las Villas, Santa Clara, Cuba

e-mail: rbellop@uclv.edu.cu

Emilio S. Corchado, University of Salamanca, Salamanca, Spain

e-mail: escorchado@usal.es

Hani Hagras, University of Essex, Colchester, UK

e-mail: hani@essex.ac.uk

László T. Kóczy, Széchenyi István University, Győr, Hungary

e-mail: koczy@sze.hu

Vladik Kreinovich, University of Texas at El Paso, El Paso, USA

e-mail: vladik@utep.edu

Chin-Teng Lin, National Chiao Tung University, Hsinchu, Taiwan

e-mail: ctlin@mail.nctu.edu.tw

Jie Lu, University of Technology, Sydney, Australia

e-mail: Jie.Lu@uts.edu.au

Patricia Melin, Tijuana Institute of Technology, Tijuana, Mexico

e-mail: epmelin@hafsamx.org

Nadia Nedjah, State University of Rio de Janeiro, Rio de Janeiro, Brazil

e-mail: nadia@eng.uerj.br

Ngoc Thanh Nguyen, Wroclaw University of Technology, Wroclaw, Poland

e-mail: Ngoc-Thanh.Nguyen@pwr.edu.pl

Jun Wang, The Chinese University of Hong Kong, Shatin, Hong Kong

e-mail: jwang@mae.cuhk.edu.hk

More information about this series at <http://www.springer.com/series/11156>

Ajith Abraham · Abdelkrim Haqiq
Azah Kamilah Muda · Niketa Gandhi
Editors

Proceedings of the Ninth
International Conference
on Soft Computing
and Pattern Recognition
(SoCPaR 2017)

Editors

Ajith Abraham
Machine Intelligence Research Labs
Auburn, WA
USA

Abdelkrim Haqiq
Faculty of Sciences and Techniques
Hassan 1st University
Settat
Morocco

Azah Kamilah Muda
Faculty of Information and Communication
Technology
Universiti Teknikal Malaysia Melaka
Durian Tunggal, Melaka
Malaysia

Niketa Gandhi
Machine Intelligence Research Labs
Auburn, WA
USA

ISSN 2194-5357 ISSN 2194-5365 (electronic)
Advances in Intelligent Systems and Computing
ISBN 978-3-319-76356-9 ISBN 978-3-319-76357-6 (eBook)
<https://doi.org/10.1007/978-3-319-76357-6>

Library of Congress Control Number: 2018935894

© Springer International Publishing AG, part of Springer Nature 2018

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG part of Springer Nature
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Welcome to the Proceedings of the ninth International Conference on Soft Computing and Pattern Recognition (SoCPaR 2017). Conferences were held at Mogador Hotels & Resorts, Marrakech, Morocco, during December 11–13, 2017. SoCPaR 2016 was held in VIT University, Vellore, India, and this year’s event is jointly organized by the Machine Intelligence Research Labs (MIR Labs), USA, and Faculty of Sciences and Techniques, Hassan 1st University, Settat, Morocco.

SoCPaR 2017 is organized to bring together worldwide leading researchers and practitioners interested in advancing the state of the art in soft computing and pattern recognition, for exchanging knowledge that encompasses a broad range of disciplines among various distinct communities. It is hoped that researchers and practitioners will bring new prospects for collaboration across disciplines and gain inspiration to facilitate novel breakthroughs. The themes for this conference are thus focused on “Innovating and Inspiring Soft Computing and Intelligent Pattern Recognition.”

The themes of the contributions and scientific sessions range from theories to applications, reflecting a wide spectrum of the coverage of soft computing, intelligent systems, computational intelligence, and its applications. SoCPaR 2017 received submissions from over 20 countries, and each paper was reviewed by at least 5 reviewers in a standard peer-review process. Based on the recommendation by 5 independent referees, finally 18 papers were accepted for publication in the proceedings published by Springer, Verlag.

Many people have collaborated and worked hard to produce a successful SoCPaR 2017 conference. First and foremost, we would like to thank all the authors for submitting their papers to the conference, for their presentations and discussions during the conference. Our thanks go to Program Committee members and reviewers, who carried out the most difficult work by carefully evaluating the submitted papers. Our special thanks to Oscar Castillo (Tijuana Institute of

Technology, Tijuana, Mexico) and Alexander Gelbukh (Instituto Politécnico Nacional, Mexico City, Mexico) for the exciting plenary talks.

We express our sincere thanks to special session chairs and organizing committee chairs for helping us to formulate a rich technical program.

Abdelkrim Haqiq
Ajith Abraham
SoCPaR 2017 - General Chairs

SoCPaR 2017 Organization

Honorary Chairs

Ahmed Nejmeddine	President of Hassan 1st University, Settat, Morocco
Houssine Bouayad	Acting Dean of FST, Hassan 1st University, Settat, Morocco

General Chairs

Abdelkrim Haqiq	GRENTIC, FST, Hassan 1st University, Settat, Morocco
Ajith Abraham	MIR Labs, USA

General Co-chairs

Layth Sliman	EFREI, Paris, France
Adel M. Alimi	University of Sfax, Tunisia

PC Co-chairs

Simone Ludwig	North Dakota State University, USA
Antonio J. Tallón-Ballesteros	University of Seville, Spain
Arpad Kelemen	University of Maryland, USA

Advisory Board

Albert Zomaya	The University of Sydney, Australia
Andre Ponce de Leon F. de Carvalho	University of Sao Paulo at Sao Carlos, Brazil
Bruno Apolloni	University of Milano, Italy
Hideyuki Takagi	Kyushu University, Japan
Imre J. Rudas	Óbuda University, Hungary
Janusz Kacprzyk	Polish Academy of Sciences, Poland
Javier Montero	Complutense University of Madrid, Spain
Krzysztof Cios	Virginia Commonwealth University, USA
Mario Koeppen	Kyushu Institute of Technology, Japan
Mohammad Ishak Desa	Universiti Teknikal Malaysia Melaka, Malaysia
Patrick Siarry	Université Paris-Est Créteil, France
Ronald Yager	Iona College, USA
Salah Al-Sharhan	Gulf University of Science and Technology, Kuwait
Sebastian Ventura	University of Cordoba, Spain
Vincenzo Piuri	Università degli Studi di Milano, Italy

Publication Chairs

Azah Kamilah Muda	UTeM, Malaysia
Niketa Gandhi	Machine Intelligence Research Labs, USA

Web Service

Kun Ma	University of Jinan, China
--------	----------------------------

Publicity Chairs

Mohamed Nemiche	Ibn Zohr University, Agadir, Morocco
Ali Wali	University of Sfax, Tunisia
Brahim Ouhbi	ENSAM, Moulay Ismail University, Meknès, Morocco

Organizing Chairs

Jaouad Dabounou	FST, Hassan 1st University, Settat, Morocco
Mohamed Hanini	FST, Hassan 1st University, Settat, Morocco
Mohamed Chakraoui	Multidisciplinary Faculty of Khouribga, Morocco

Organizing Committee

Younna El Hiss	FST, Hassan 1st University, Settat, Morocco
Ayman Hadri	FST, Hassan 1st University, Settat, Morocco
Amine Maarouf	xHub, Technopark, Casablanca, Morocco
Ahmed Boujnoui	FST, Hassan 1st University, Settat, Morocco
Hamid Taramit	FST, Hassan 1st University, Settat, Morocco
Adnane El Hanjri	FST, Hassan 1st University, Settat, Morocco
El Mehdi Kandoussi	FST, Hassan 1st University, Settat, Morocco

International Program Committee

Abdelkrim Haqiq	Hassan 1st University, Morocco
Abdellah Ezzati	Hassan 1st University, Morocco
Ajith Abraham	Machine Intelligence Research Labs, USA
Alberto Cano	University of Córdoba, Spain
Aswani Cherukuri	VIT University, India
Azah Kamilah Muda	Universiti Teknikal Malaysia Melaka, Malaysia
Brahim Ouhbi	Université Moulay Ismail, Morocco
Cyril de Runz	University of Reims, France
Daoui Cherki	University Sultan Moulay Slimane, Morocco
Dominique Laurent	Université Cergy-Pontoise, France
Dragan Simic	University of Novi Sad, Serbia
Driss Bouzidi	Mohammed V University, Morocco
Eduardo Solteiro Pires	University of Trás-os-Montes and Alto Douro, Portugal
Eiji Uchino	Yamaguchi University, Japan
Elizabeth Goldberg	Universidade Federal do Rio Grande do Norte, Brazil
Erkan Bostanci	Ankara University, Turkey
Eulalia Szmidt	Systems Research Institute Polish Academy of Sciences, Poland
Francisco De A. T. De Carvalho	Universidade Federal de Pernambuco, Brazil
Francisco Martine	National Institute for Astrophysics, Optics and Electronics, France

Gerard Dreyfus	ESPCI ParisTech, France
Giorgio Fumera	University of Cagliari, Italy
Giuseppina Gini	Politecnico di Milano, Italy
Jolanta Mizera-Pietraszko	Opole University, Poland
José Valente De Oliveira	Universidade do Algarve, Portugal
Katsuhiko Honda	Osaka Prefecture University, Japan
Kelemen Arpad	University of Maryland, USA
Keun Ho Ryou	Chungbuk National University, South Korea
Konstantinos Parsopoulos	University of Ioannina, Greece
Korhan Karabulut	Yaşar Üniversitesi, Turkey
Kyriakos Kritikos	Foundation for Research and Technology (FORTH) Hellas, Greece
Laurence Amaral	Universidade Federal de Uberlândia, Brazil
Lee Chang Yong	Kongju National University, South Korea
Leocadio G. Casadoc	University of Almería, Spain
Liliana Ironic	Consiglio Nazionale delle Ricerche, Italy
Lin Wang	Jinan University, China
Lubna Gabrallac	Sudan University of Science and Technology, Sudan
Ludwig Simonec	North Dakota State University, USA
Millie Pant	Indian Institute of Technology Roorkee, India
Muhammad Iqbal	Victoria University of Wellington, New Zealand
Nabil Laachfoubi	Hassan 1st University, Morocco
Nadia El Mrabet	LIASD - Université Paris 8, France
Niketa Gandhi	Machine Intelligence Research Labs, USA
Nizar Rokbani	École Nationale d'Ingénieurs de Sfax, Tunisia
Oscar Castillo	Instituto Tecnológico de Tijuana, Mexico
Pranab Muhuri	South Asian University, India
Said El Kafhali	Hassan 1st University, Morocco
Saverio De Vito	ENEA, Italy
Swati V. Shinde	Pimpri Chinchwad College of Engineering, India
Tarun Sharma	Indian Institute of Technology Roorkee, India
Valeriu Beiu	United Arab Emirates University, United Arab Emirates
Varun Kumar Ojha	Swiss Federal Institute of Technology, Switzerland
Vincenzo Piuri	Università degli Studi di Milano, Italy
Virgilijus Sakalauskas	Vilnius University, Lithuania
Wei Chiang Hong	Oriental Institute of Technology, Taiwan
Wen Yang Lin	National University of Kaohsiung, Taiwan
Weng Kin Lai	The Institution of Engineering and Technology, Malaysia

Additional Reviewers

Maria Salvato
Sandeep Kumar
Youssef Baddi

University of Maryland, Baltimore, USA
South Asian University, New Delhi, India
ENSIAS - Mohammed V-Souissi University,
Rabat, Morocco

Fabiano Dorça
Elena Esposito

Federal University of Uberlândia, MG, Brazil
University of Lausanne (DEEP-HEC),
Switzerland

Contents

An Energy-Efficient MAC Protocol for Mobile Wireless Sensor Network Based on IR-UWB	1
Anouar Darif, Chaibi Hasna, and Rachid Saadane	
Obstacle Detection Algorithm by Stereoscopic Image Processing	13
Adil Elachhab and Mohammed Mikou	
A Simultaneous Topic and Sentiment Classification of Tweets	24
Doaa Hassan	
Local Directional Multi Radius Binary Pattern	34
Mohamed Kas, Youssef El Merabet, Yassine Ruichek, and Rochdi Messoussi	
Content-Based Image Retrieval Approach Using Color and Texture Applied to Two Databases (Coil-100 and Wang)	49
El Mehdi El Aroussi, Nouredine El Houssif, and Hassan Silkan	
Shape Classification Using B-spline Approximation and Contour Based Shape Descriptors	60
Youssef Ait Khouya and Faouzi Ghorbel	
An Image Processing Based Framework Using Crowdsourcing for a Successful Suspect Investigation	70
Hasna El Alaoui El Abdallaoui, Fatima Zohra Ennaji, and Abdelaziz El Fazziki	
Recognition and Classification of Arabic Fricative Consonants	81
Youssef Elfahm, Badia Mounir, Ilham Mounir, Laila Elmaazouzi, and Abdelmajid Farchi	
Cancer Classification Using Gene Expression Profiling: Application of the Filter Approach with the Clustering Algorithm	90
Sara Haddou Bouazza, Khalid Auhmani, Abdelouhab Zeroual, and Nezha Hamdi	

Detection of Negative Emotion Using Acoustic Cues and Machine Learning Algorithms in Moroccan Dialect	100
Abdellah Agrima, Laila Elmazouzi, Ilham Mounir, and Abdelmajid Farchi	
Using Multiple Minimum Support to Auto-adjust the Threshold of Support in Apriori Algorithm	111
Azzeddine Dahbi, Youssef Balouki, and Taoufiq Gadi	
Prediction of the Degree of Parkinson’s Condition Using Recordings of Patients’ Voices	120
Clara Jiménez-Recio, Alexander Zlotnik, Ascensión Gallardo-Antolín, Juan M. Montero, and Juan Carlos Martínez-Castrillo	
An Overview of a Distributional Word Representation for an Arabic Named Entity Recognition System	130
Chaimae Azroumahli, Yacine El Younoussi, and Ferdaouss Achbal	
Discrete Particle Swarm Optimization for Travelling Salesman Problems: New Combinatorial Operators	141
Morad Bouzidi, Mohammed Essaid Riffi, and Ahmed Serhir	
On Maximal Frequent Itemsets Enumeration	151
Said Jabbour, Fatima Zahra Mana, and Lakhdar Sais	
Particle Swarm Optimization as a New Measure of Machine Translation Efficiency	161
José Angel Montes Olguín, Jolanta Mizera-Pietraszko, Ricardo Rodriguez Jorge, and Edgar Alonso Martínez García	
Experimental Investigation of Ant Supervised by Simplified PSO with Local Search Mechanism (SAS-PSO-2Opt)	171
Ikram Twir, Nizar Rokbani, Abdelkrim Haqiq, and Ajith Abraham	
A Human Identification Technique Through Dorsal Hand Vein Texture Analysis Based on NSCT Decomposition	183
Amira Oueslati, Nadia Feddaoui, and Kamel Hamrouni	
Author Index	195