

# Lecture Notes in Artificial Intelligence 7208

Subseries of Lecture Notes in Computer Science

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# Hybrid Artificial Intelligent Systems

7th International Conference, HAIS 2012  
Salamanca, Spain, March 28-30, 2012  
Proceedings, Part I

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# Preface

This volume of Lecture Notes in Artificial Intelligence (LNAI) includes accepted papers presented at the 7th HAIS held in the beautiful and historic city of Salamanca, Spain, in March 2012.

The International Conference on Hybrid Artificial Intelligence Systems (HAIS 2012) has become a unique, established and broad interdisciplinary forum for researchers and practitioners who are involved in developing and applying symbolic and sub-symbolic techniques aimed at the construction of highly robust and reliable problem-solving techniques to present the most relevant achievements in this field.

Hybridization of intelligent techniques, coming from different computational intelligence areas, has become popular because of the growing awareness that such combinations frequently perform better than the individual techniques such as neurocomputing, fuzzy systems, rough sets, evolutionary algorithms, agents and multiagent Systems, among others.

Practical experience has indicated that hybrid intelligence techniques might be helpful to solve some of the challenging real-world problems. In a hybrid intelligence system, a synergistic combination of multiple techniques is used to build an efficient solution to deal with a particular problem. This is, thus, the setting of HAIS conference series, and its increasing success is proof of the vitality of this exciting field.

HAIS 2012 received 293 technical submissions. After a rigorous peer-review process, the International Program Committee selected 118 papers, which are published in these conference proceedings. In this edition a special emphasis was put on the organization of special sessions and workshops. Eight special sessions and one workshop, containing 67 papers in total, were organized on the following topics:

## Special Sessions:

- Systems, Man, and Cybernetics by HAIS
- Methods of Classifier Fusion
- HAIS for Computer Security
- Data Mining: Data Preparation and Analysis
- Hybrid Artificial Intelligence Systems in Management of Production Systems
- Hybrid Artificial Intelligent Systems for Ordinal Regression
- Hybrid Metaheuristics for Combinatorial Optimization and Modelling Complex Systems
- Hybrid Computational Intelligence and Lattice Computing for Image and Signal Processing

## Workshops:

- Nonstationary Models of Pattern Recognition and Classifier Combinations

The selection of papers was extremely rigorous in order to maintain the high quality of the conference, and we would like to thank the Program Committee for their hard work in the reviewing process. This process is very important to the creation of a conference of high standard and the HAIS conference would not exist without their help.

The large number of submissions is certainly not only testimony to the vitality and attractiveness of the field but an indicator of the interest in the HAIS conferences themselves.

HAIS 2012 enjoyed outstanding keynote speeches by distinguished guest speakers: Tom Heskes, Radboud Universiteit Nijmegen (The Netherlands) and Xindong Wu, University of Vermont (USA).

HAIS 2012 teamed up with the *Neurocomputing* (Elsevier) and the *Applied Soft Computing* (Elsevier) journals for special issues and fast-track publication including selected papers from the conference.

Particular thanks also go to the conference main sponsors, IEEE-Sección España, IEEE Systems, Man and Cybernetics -Capítulo Español, AEPIA, World Federation of Soft Computing, MIR Labs, IT4Innovation Centre of Excellence, The International Federation for Computational Logic, Ministerio de Economía y Competitividad, Junta de Castilla y León, Ayuntamiento de Salamanca, University of Salamanca, who jointly contributed in an active and constructive manner to the success of this initiative. We also want to extend our warm gratitude to all the Special Session and Workshop Chairs for their continuing support of the HAIS series of conferences.

We would like to thank Alfred Hofmann and Anna Kramer from Springer for their help and collaboration during this demanding publication project.

March 2012

Emilio Corchado  
Václav Snášel  
Ajith Abraham  
Michał Woźniak  
Manuel Graña  
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Bruno Baroque	University of Burgos, Spain
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José Luis Calvo Rolle	University of Coruña, Spain
María Dolores Muñoz	University of Salamanca, Spain
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### Methods of Classifier Fusion

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