Artificial Intelligence Research and Development
Proceedings of the 15th International Conference of the Catalan Association for Artificial Intelligence

Edited by
David Riaño
Universitat Rovira i Virgili, Tarragona, Spain
Eva Onaindia
Universitat Politècnica de València, València, Spain
and
Miguel Cazorla
Universitat d’Alacant, Alacant, Spain

IOS Press
Amsterdam • Berlin • Tokyo • Washington, DC
## Contents

Preface  
*David Riaño, Eva Onaindia and Miguel Cazorla*  
Conference Organization  

### Invited Talks

Some Real-World Applications of Soft Artificial Intelligence: Scientogram Mining, Assembly Line Balancing, and Forensic Identification  
*Óscar Cordón*

Challenges of Automation and Safety in Field Robotics  
*Eduardo Nebot*

### KDD, DM and Machine Learning

Data Mining and Query Answer Techniques Applied to a Bio-Nutritional Trials Focused Expert System  
*Oscar Alonso, Pedro De La Peña, Aitor Moreno, Gabriel Anzaldi and Xavier Domingo*

The Use of the Traffic Lights Panel as a Goodness-of-Clustering Indicator: An Application to Financial Assets  
*Dante Conti and Karina Gibert*

Using Gabriel Graphs in Borderline-SMOTE to Deal with Severe Two-Class Imbalance Problems on Neural Networks  
*P. Toribio, R. Alejo, R.M. Valdovinos and J.H. Pacheco-Sanchez*

Active Learning of Actions Based on Support Vector Machines  
*Francisco Ruiz, Albert Samà and Núria Agell*

Towards the Formalization of Re-Identification for Some Data Masking Methods  
*Vicenç Torra*

### Natural Language Processing and Recommenders

Towards Object Descriptions in Natural Language from Qualitative Models  
*Zoe Falomir, Lledó Museros, Pablo Ródenas and Ismael Sanz*

Semantically-Enhanced Recommenders  
*Victor Codina and Luigi Ceccaroni*
Computer Vision

Supervised Texture Classification Using Optimization Techniques 81
Domenec Puig, Jaime Melendez, Agustí Solanas, Aida Valls and Antonio Moreno

Modelling Facial Expressions Dynamics with Gaussian Process Regression 91
Adria Ruiz and Xavier Binefa

Survey on 2D and 3D Human Pose Recovery 101
Xavier Perez-Sala, Sergio Escalera and Cecilio Angulo

A Study of Registration Techniques for 6DoF SLAM 111
Vicente Morell, Miguel Cazorla, Diego Viejo, Sergio Orts and Jose Garcia

Robotics

Object Detection Methods for Robot Grasping: Experimental Assessment and Tuning 123
Ferran Rigual, Arnau Ramisa, Guillem Alenya and Carme Torras

The Role of i-Walker in Post-Stroke Training 133
Benedetta Giuliani, Ulises Cortés, Antonio Martínez-Velasco, Cristian Barrué and Roberta Annicchiarico

Using a RGB-D Camera for 6DoF SLAM 143
Jose Muñoz, Daniel Pastor, Pablo Gil, Santiago Puente and Miguel Cazorla

Learning Topological SLAM Using Visual Information 151
Anna Romero and Miguel Cazorla

AI for Optimization Problems

Exploring Genetic Algorithms and Simulated Annealing for Immobile Location-Allocation Problem 163
Ferran Torrent, Victor Muñoz and Beatriz López

Analysis and Generation of Pseudo-Industrial MaxSAT Instances 173
Carlos Ansótegui, Maria Luisa Bonet, Jordi Levy and Chu Min Li

A SAT-Based Approach to MinSAT 185
Carlos Ansótegui, Chu Min Li, Felip Manyà and Zhu Zhu

Multicast Session Protection Planner – Tool to Plan and Deploy Protection Infrastructure: A SPEA Approach 191
Ferney A. Maldonado-Lopez and Yezid Donoso

AI Applications to Real World

A Case-Based Hybrid System for Injection Molding Sensorization 203
Isaac Pinyol, Raquel Ventura and David Cabanillas
First Studies on Self-Preserving Digital Objects
Josep Lluis De La Rosa and José Antonio Olvera

Intelligent Building Energy Management Through Holistic Knowledge Based Approach
Gabriel Anzaldi, Aitor Corchero, Dan Gutu, Milan Marinov, Michael James Dibley and Kris McGlinn

Quantitative and Qualitative Approaches for Stock Movement Prediction
Jordi Petchamé, Àngela Nebot and René Alquézar

Subject Index
Author Index