

# Preface

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The Catalan Association of Artificial Intelligence (ACIA, <http://www.acia.org>) was founded in September 1994 as a non-profit association for the development and dissemination of Artificial Intelligence (AI) in Catalan society. ACIA's main goal is to support communication between the persons and organizations involved in AI as well as to promote social, cultural, scientific, economic and governmental awareness of AI. Today, ACIA is the backbone of the Catalan AI community, which is quite active at both a local and international level and from the academic to the corporate sector. ACIA is a member of the European Coordinating Committee for Artificial Intelligence (ECCAI), since 1995.

This special issue shows the research activity in the field of Artificial Intelligence developed by the AI community in Catalonia. In particular, the issue contains extended versions of the best papers presented in the last edition of the International Conference of the Catalan Association for Artificial Intelligence, held in the city of Vic in October 2013, in the geographical center of Catalonia, a city with an ancient Iberian origin (Fourth Century BC), a roman settlement dating back to the Third Century BC, and playing a central role in Catalan history from the middle ages to the Eighteenth Century.

The ACIA meetings started in 1995, with the aim of becoming the forum of the Catalan AI community. The first meetings were local and informal, but soon the association held their meetings in the form of Conferences. In 1998 the first International Conference of the Catalan Association for Artificial Intelli-

gence (the CCIA), took place in Tarragona, with an open approach to the international community. From then onwards, every year the CCIA has been organized in all the Catalan lands, including many cities in Catalonia, but also in the Spanish provinces of Balearic Islands and Valencia, and main cities in foreign countries retaining the Catalan culture, like Perpignan, in Catalunya-Nord (Southern France), Andorra or l'Alghero in Sardegna (Italy).

The CCIA'2013 is the 16th edition of the conference and, as said before, it was held in the city of Vic. This edition of the conference was organized by the Digital Technologies Group of Universitat the Vic, with the help of the Knowledge Engineering and Machine Learning Group (KEMLG) of the Universitat Politècnica de Catalunya-BarcelonaTech and the Grup de Tecnologia Informàtica i Intel·ligència Artificial (GTI-IA) of the Computer Systems and Computation Department of the Universitat Politècnica de València.

The CCIA is today consolidated as the annual meeting point of the Catalan AI community, which can be seen as a strong community, with a lot of scientific activity and a good level of internationalization. Most of the institutions in the Catalan territory support the conference by participating in the scientific committee or by submitting contributions. The number of submissions and the wide range of AI topics addressed reflects the good health of this community. A 17.5% of the scientific committee composed by reputed researchers from the international AI community and the international authors sharing authorship in the contributed papers reflect the internationalization of the Catalan AI community. Also, a non-neglectable number of researchers formed in the Catalan AI community are now

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developing their scientific activities in international research centers and some of them have been supporting CCIA as invited speakers in past editions.

In this edition, we are very honored to have been supported by a Scientific Committee including members from all the Catalan, Balearic and Valencian universities, both public and private, from the main AI research institutes in Catalonia, the Basque Country, Southern France and international members from Australia, Austria, Germany, France, Italy, Romania, Switzerland and Venezuela.

The CCIA'2013 received 50 original contributions from Catalonia (involving 100 authors), Valencia (7 authors), the rest of Spain (5), Belgium (1), Canada (1), Germany (2), Italy (2), Jamaica (1), Mexico (2), Ukraine (1), United Kingdom (4) and United States (1). Submitted contributions were carefully reviewed by two or three members of the Scientific Committee. The papers with the best evaluation for their relevance to CCIA topics, originality, technical validity, relevance of conclusions, were invited to elaborate an extended version of the submitted paper for this special issue, with significant additional contribution.

Eighteen reviewers were invited to evaluate the submitted papers for this special issue. From them, 6 members belong to the Scientific committee of the CCIA conference and come from the following institutions: Universitat Politècnica de Catalunya (Barcelona, Spain), Institut d'Investigació en Intel·ligència Artificial (Bellaterra, Spain), Universitat Politècnica de València (València, Spain), Universitat Rovira i Virgili (Tarragona, Spain), Universitat de Girona (Girona, Spain). They had the special additional commitment of evaluating the significance of the extended paper with regards to the previous conference paper. Other 12 additional reputed reviewers from the international community were invited, totally external to CCIA, coming from the following institutions: Università Milano-Bicocca (Italy), Università di Catania (Italy), Université de Lausanne (Suïssa), University Ploiești (Romania), University of Graz (Austria), Universidade Estadual de Campinas (Sao Paulo, Brazil), The National Institute of Astrophysics, Optics and Electronics (Puebla, México), University of Technology (Sydney, Australia), Universitat Politècnica de Catalunya (Barcelona, Spain), Institut d'Investigació en Intel·ligència Artificial (Bellaterra, Spain), Universitat Politècnica de València (València, Spain), Institut de Robòtica i Informàtica Industrial (Barcelona, Spain). We want to especially thank the Scientific Committee of this special issue for the excellent reviewing work done.

The papers submitted to CCIA'2013 have been organized around different topics, with a good coverage of the different AI branches and specializations, from more theoretical to more applied and from more symbolic to more perceptive approaches. The papers included in this special issue, among the best works presented in the conference, constitute a good representation of the research in AI developed in the Catalan AI community. This issue includes 11 works on Planning, Logic Programming, Relational Learning, Semi-Supervised Learning, Normative Systems and Multi-agent Systems, Perception and Image or Signal Processing; Semantic approaches, Pattern extraction in general (including Classifiers, Clustering and Data Mining); Post-processing, Recommenders, Interpretability and Decision Support. Also, a variety of domain applications are covered in this issue, like optical networks, e-communities, e-learning, water systems management and modelling, ecology or tourism.

The paper "FLAP: Applying least-commitment in forward-chaining planning" from Oscar Sapena, Eva Onaindia and Alejandro Torreño provides a new approach and a novel combination of heuristics for partial order planning where decisions are delayed as much as possible to improve solutions and search.

The paper "Solving the Routing and Wavelength Assignment problem with conflict-driven ASP solvers" from Teresa Alsinet, Ramón Béjar, Cèsar Fernández, Francesc Guitart and Carles Mateu faces the NP-hard problem of Routing and Wavelength assignment in optical networks, by solving it with ASP encodings and solvers and analyzing the effects of encoding on performance.

The paper "Refinement-based disintegration: An approach to re-representation in relational learning" from Santiago Ontañón and Enric Plaza proposes a novel graph-based representation for relational data that improves learning.

The paper "Graph constrained label propagation on water supply networks" from Manuel Herrera, Eva Ramos-Martínez, Joaquín Izquierdo and Rafael Pérez-García faces the transduction over graphs in a semi-supervised learning problem, applied to learn the vulnerability of water supply networks to develop biofilms.

The paper "Using IRON to build frictionless on-line communities" from Javier Morales, Iosu Mendizábal, David Sánchez-Pinsach, Maite López-Sánchez and Juan A. Rodríguez-Aguilar provides an innovative proposal for automatic generation of a normative system oriented to moderate and regulate agent-based on-line communities.

The paper “Sketch retrieval based on qualitative shape similarity matching: Towards a tool for teaching geometry to children” from Lledó Museros, Zoe Falomir, Ismael Sanz and Luis González-Abril provides a semantic feature extraction from polygon images that permits intelligent image retrieval in an e-learning geometry application for children.

The paper “Automatic non-verbal communication skills analysis: A quantitative evaluation” from Álvaro Cepero, Albert Clapés and Sergio Escalera is also placed in the e-learning field and perception, in this case in an integral proposal combining audio, face and gesture images to evaluate the quality of oral presentations through relevant feature extraction methods, data fusion and classifiers.

The paper “Features extraction based on the Discrete Hartley Transform for closed contour” from Pere Martí-Puig, Ramon Reig-Bolaño and Jaume Danes is related with intelligent image processing and uses a particular feature extraction method to improve recognition of fish species from the image of some characteristic bones in their ears.

The paper “aTLP: A color-based model of uncertainty to evaluate the risk of decisions based on prototypes” from Karina Gibert and Dante Conti stresses the importance of understanding results of a clustering process from a conceptual point of view and the

links between this comprehension process and decision support. It proposes a visual symbolic tool to support class or prototypes conceptualization and applies it to understand the various situations that might occur in a Wastewater treatment plant.

The paper “Personalised recommendations based on novel semantic similarity and clustering procedures” from Antonio Moreno, Aïda Valls, Sergio Martínez, Carlos Vicient, Lucas Marín and Ferran Mata takes advantage of semantics to improve recommender systems and presents an application to a recommender of touristic cities upon user preferences.

The paper “An efficient closed frequent itemset miner for the MOA stream mining system” from Massimo Quadrana, Albert Bifet and Ricard Gavaldà surveys several methods for frequent itemset identification (and consequently, for building association rules) in data streams, and describes, evaluates, and gives performance guarantees for a given implementation.

We would like to express our gratitude to all the authors who supported this edition of CCIA by sending their contributions, to all members of the scientific and organizing committees who worked hard to make the CCIA'2013 a success, and to Vicenç Torra, president of ACIA, for his kind support and involvement.

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