

# *Introduction to the 28th international conference on logic programming special issue*

AGOSTINO DOVIER

*Dip. di Matematica e Informatica, Univ. di Udine, Italy*  
(e-mail: [agostino.dovier@uniud.it](mailto:agostino.dovier@uniud.it))

VÍTOR SANTOS COSTA

*CRACS INESC-TEC and Dep. de Ciência de Computadores, Univ. do Porto, Portugal*  
(e-mail: [vsc@dcc.fc.up.pt](mailto:vsc@dcc.fc.up.pt))

We are proud to introduce this special issue of the Journal of Theory and Practice of Logic Programming (TLP), dedicated to the full papers accepted for the 28th International Conference on Logic Programming (ICLP). The ICLP meetings started in Marseille in 1982 and since then constitute the main venue for presenting and discussing work in the area of logic programming.

We contributed to ICLP for the first time in 1991. The first guest-editor had a paper on logic programming with sets, and the second had two papers on the parallel implementation of the Andorra model. Since then, we continued pursuing research in this exciting area and ICLP has always been the major venue for our work. Thus, when the executive committee of the Association for Logic Programming (ALP) kindly invited us for chairing the 2012 edition we were delighted to accept.

We particularly appreciate the honor and responsibility of organising ICLP in Budapest. Hungary has had a central role both in implementation and in the application of logic programming. Indeed, the role of Hungary in general in Computer Science is widely recognized, and organizing this meeting in the town of John von Neumann, one of the “talent-scouts” of Turing, in the centenary of the birth of the latter, is just another reason for justifying the fact that the fascinating Budapest is the unique town to host ICLP twice.

Publishing the ICLP full papers as a special issue is a joint initiative taken by the Association for Logic Programming and by Cambridge University Press. The goal is to achieve fast journal publication of the highest quality papers from the logic programming community, by selecting the best ICLP submissions before the meeting. This approach benefits the authors, by facilitating journal publication, and benefits the community, by allowing researchers to access high quality journal papers on the more recent and important results in the field. Quality is ensured by a two-step refereeing process, and by an active and very much participating program committee. The approach was first experimented in 2010, and has had favorable feedback since.

This year, ICLP sought contributions in all areas of logic programming, including but not restricted to the following areas. *Theory*: Semantic Foundations, Formalisms, Non-monotonic Reasoning, Knowledge Representation; *Implementation*: Compilation, Memory Management, Virtual Machines, Parallelism; *Environments*: Program Analysis, Transformation, Validation, Verification, Debugging, Profiling, Testing; *Language Issues*: Concurrency, Objects, Coordination, Mobility, Higher Order, Types, Modes, Assertions, Programming Techniques; *Related Paradigms*: Abductive Logic Programming, Inductive Logic Programming, Constraint Logic Programming, Answer-Set Programming; *Applications*: Databases, Data Integration and Federation, Software Engineering, Natural Language Processing, Web and Semantic Web, Agents, Artificial Intelligence, Bioinformatics.

In response to the call for papers we received 102 abstracts, 90 of which remained as complete submissions. Of these, 81 were submitted as full papers and 9 as technical communications. Each paper was reviewed by at least three anonymous program committee members, selected by the program chairs. Sub-reviewers were allowed. After discussion, involving the whole program committee, 10 submitted papers were considered as deserving of TPLP publication with minor changes. The authors of other 10 submitted papers were asked to address more serious concerns, mostly regarding presentation improvements or more complete experimental validation. 37 papers instead have been judged to deserve a slot for a short presentation at the Meeting and a “technical communication” publication in the Volume 17 of the Leibniz International Proceedings in Informatics (LIPIcs) series.

The whole set of accepted papers includes 36 technical papers, 12 application papers, 5 system and tool papers, and 4 papers submitted directly as technical communications.

The Conference program was honored to include contributions from three keynote speakers and from a tutorialist. Two invited speakers come from industry, namely Ferenc Darvas from *CompuDrug International, Inc.* Sedona, Arizona, and *ComGrid Kft*, Budapest (two companies using computer science techniques for chemistry), and Mike Elston from *SecuritEase* (an Australian company developing stock brokering tools). Moreover, Jan Wielemaker, of the VU University Amsterdam, presented an history of the first 25 years of SWI Prolog, one of the major (and free) Prolog releases. Tutorialist Viviana Mascardi from University of Genova (Italy) introduced us to the hot topic of “Logic-based Agents and the Semantic Web”.

The first ICLP Conference was organized 30 years to this year, in Marseille. During those 30 years, ICLP has been a major venue in Computer Science. In order to acknowledge some of the major contributions that have been fundamental to the success of LP as a field, the ALP executive committee decided that ICLP should recognize the most influential papers presented in the ICLP and ILPS conferences (ILPS was another major meeting in logic programming, organized until 1998), that, 10 and 20 years onwards, have been shown to be a major influence in the field. As program co-chairs of ICLP2012, we were the first to be charged with this delicate task. We included papers from ICLP 1992 and ILPS 1992, 20 years onwards, and of ICLP 2002, 10 years onwards. Our procedure was to use biblio-metric information in a first stage, and to use our own personal criteria in a second stage, if necessary.

Given that this is the first time this award was given we also considered 1991, and 2001 papers. Although there are an impressive number of excellent papers in 1991 and 1992, one paper emerges with an outstanding record of roughly 600 citations. Further, the paper clearly has a very major influence in the field. The paper is

- Michael Gelfond and Vladimir Lifschitz: Representing Actions in Extended Logic Programming. JICSLP 1992: 559–573

The 10 years onward analysis again produced a group of excellent papers (as expected, the number of citations was strictly less than for 20 years old papers). In this case choosing the winner in a very short list was more difficult. Acknowledging their influence over the very active field of Web Databases and Semantic Web, our selection went to:

- François Bry and Sebastian Schaffert: Towards a Declarative Query and Transformation Language for XML and Semistructured Data: Simulation Unification. ICLP 2002: 255–270

We therefore invited these authors for an invited talk in a special session at the meeting. We would like to remark that in 2004 three papers were prized as “Most Influential Paper in 20 Years Award from the Association for Logic Programming”. The award went (again) to Gelfond-Lifschitz for their 1988 ICLP/SLP paper on stable model semantics, to Jaffar-Lassez for their POPL 1987 paper on Constraint Logic Programming, and to Saraswat, Rinard, and Panangaden for their POPL 1991 paper on Concurrent Constraint Programming.

Together, the journal special issue and the LIPICs volume of short technical communications constitute the proceedings of ICLP 2012. The list of the 20 accepted full papers appearing in this special issue follows:

- Disjunctive Datalog with Existential Quantifiers: Semantics, Decidability, and Complexity Issues  
*Mario Alviano, Wolfgang Faber, Nicola Leone, and Marco Manna*
- Towards Multi-Threaded Local Tabling Using a Common Table Space  
*Miguel Areias and Ricardo Rocha*
- Module Theorem for the General Theory of Stable Models  
*Joseph Babb and Joohyung Lee*
- Typed Answer Set Programming Lambda Calculus and Corresponding Inverse Lambda Algorithms  
*Chitta Baral, Juraj Džifcak, Marcos Gonzalez, and Aaron Gottesman*
- D-FLAT: Declarative Problem Solving Using Tree Decompositions and Answer-Set Programming  
*Bernhard Bliem, Michael Morak, and Stefan Woltran*
- An Improved Proof-Theoretic Compilation of Logic Programs  
*Iliano Cervesato*
- Annotating Answer-Set Programs in LANA  
*Marina De Vos, Doga Gizem Kisa, Johannes Oetsch, Jörg Pührer, and Hans Tompits*

- SMCHR: Satisfiability Modulo Constraint Handling Rules  
*Gregory Duck*
- Conflict-driven ASP Solving with External Sources  
*Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl*
- Multi-threaded ASP Solving with clasp  
*Martin Gebser, Benjamin Kaufmann, and Torsten Schaub*
- Model Checking with Probabilistic Tabled Logic Programming  
*Andrey Gorlin, C. R. Ramakrishnan, and Scott Smolka*
- Diagrammatic confluence for Constraint Handling Rules  
*Rémy Haemmerlé*
- Inference in Probabilistic Logic Programs with Continuous Random Variables  
*Muhammad Islam, C.R. Ramakrishnan, and I.V. Ramakrishnan*
- Relational Theories with Null Values and Non-Herbrand Stable Models  
*Vladimir Lifschitz, Karl Pichotta, and Fangkai Yang*
- The Relative Expressiveness of Defeasible Logics  
*Michael Maher*
- Compiling Finite Domain Constraints to SAT with BEE  
*Amit Metodi and Michael Codish*
- Lightweight Compilation of (C)LP to JavaScript  
*Jose F. Morales, Rémy Haemmerlé, Manuel Carro, and Manuel Hermenegildo*
- ASP modulo CSP: The clingcon system  
*Max Ostrowski and Torsten Schaub*
- Annotation of Logic Programs for Independent AND-Parallelism by Partial Evaluation  
*German Vidal*
- Efficient Tabling of Structured Data with Enhanced Hash-Consing  
*Neng-Fa Zhou and Christian Theil Have*

The technical communications, a short paper, and the contributions to the doctoral consortium are published on-line through the Dagstuhl Research Online Publication Server (DROPS), as DOI 10.4230/LIPIcs.ICLP.2012.42. A listing of these papers is reported in the electronic appendix to this preface.

We would like to take this opportunity to acknowledge and thank the other ICLP organisers. Without their work and support this event would not have been possible. We would like to start with the General chair Péter Szeredi (Budapest Univ. of Technology and Economics), and all the organizing chairs, namely the Workshop Chair Mats Carlsson (SICS, Sweden), the Doctoral Consortium Chairs Marco Gavanelli (Univ. of Ferrara) and Stefan Woltran (Vienna University of Technology), the Prolog Programming Contest Chair Tom Schrijvers (Universiteit Gent), the Publicity Chair Gergely Lukácsy (Cisco Systems Inc.), and the Web Manager: János Csorba (Budapest Univ. of Technology and Economics). Thanks also to Alessandro Dal Palù for allowing us to publish his pictures of Budapest on the website. We benefited from material and advice kindly given by last year's program chairs Michael Gelfond and John Gallagher. Thank you very much!

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Agostino Dovier and Vítor Santos Costa  
Program Committee Chairs and Guest Editors