Introduction to the 28th International Conference on Logic Programming Special Issue

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submitted 1 January 2003; revised 1 January 2003; accepted 1 January 2003

We are proud to introduce this special issue of the Journal of Theory and Practice of Logic Programming (TPLP), 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 ALP EC committee kindly invited us for chairing the 2012 edition we were delighted to accept.

We particularly appreciate the honor and responsability 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 paper 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 *ThalesNano* (a Budapest company specialized in developing and providing microscale flow instruments 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. Ackowledging 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 Dzifcak, 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

*Theoretic Co

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 $R\acute{e}my\ Haemmerl\acute{e}$

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 Evalu-

ation
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!

On behalf of the whole LP community, we would like to thank all authors who have submitted a paper, the 41 members of the program committee: Elvira Albert (U.C. Madrid), Sergio Antoy (Portland State Univ.), Marcello Balduccini (Kodak Research Laboratories), Manuel Carro (Technical University of Madrid (UPM)), Michael Codish (Ben Gurion Univ.), Veronica Dahl (Simon Fraser Univ.), Marina De Vos (Univ. of Bath), Alessandro Dal Palù (Universita degli Studi di Parma), Bart Demoen (K.U. Leuven), Thomas Eiter (T.U. Wien), Esra Erdem (Sabanci University), Thom Frühwirth (Univ. of Ulm), Andrea Formisano (Univ. of Perugia), Maria Garcia de la Banda (Monash Univ.), Marco Gavanelli (University of Ferrara), Hai-Feng Guo (Univ. of Nebraska, Omaha), Gopal Gupta (Univ. of Texas, Dallas), Katsumi Inoue (National Inst. of Informatics, Japan), Angelika Kimmig (K.U. Leuven), Joohyung Lee (Arizona State University), Evelina Lamma (Univ. of Ferrara), Nicola Leone (University of Calabria), Yuliya Lierler (Univ. of Kentucky), Boon Thau Loo (Univ. of Pennsylvania), Michael Maher (R.R.I., Sydney), Alessandra Mileo (DERI Galway), Jose Morales (U.P. Madrid), Enrico Pontelli (New Mexico State Univ.), Gianfranco Rossi (Univ. of Parma), Beata Sarna-Starosta (Cambian, Vancouver), Torsten Schaub (Univ. of Potsdam), Tom Schrijvers (Universiteit Gent), Fernando Silva (Univ. of Porto), Tran Cao Son (New Mexico State University), Terrance Swift (Univ. Nova de Lisboa), Péter Szeredi (Budapest Univ. of Technology and Economics), Francesca Toni (Imperial College London), Mirek Truszczynski (University of Kentucky), Germán Vidal (U.P. of Valencia), Stefan Woltran (Vienna University of Technology), and Neng-Fa Zhou (CUNY, New York).

A particular thanks goes to the 96 external referees, namely: Alicia Villanueva, Amira Zaki, Ana Paula Tomás, Andrea Bracciali, Antonis Bikakis, Antonis Kakas, Brian Devries, C. R. Ramakrishnan, Chiaki Sakama, Christoph Redl, Christopher Mears, Dale Miller, Daniel De Schreye, Daniela Inclezan, David Brown, Demis Ballis, Dimitar Shterionov, Dragan Ivanovic, Evgenia Ternovska, Fabio Fioravanti, Fabrizio Riguzzi, Fangkai Yang, Fausto Spoto, Feliks Kluźniak, Francesco Calimeri, Francesco Ricca, Fred Mesnard, Gianluigi Greco, Giovanni Grasso, Gregory Duck, Gregory Gelfond, Inês Dutra, Jesus M. Almendros-Jimenez, Joost Vennekens, Juan Manuel Crespo, Julio Mariño, Kyle Marple, Marco Alberti, Marco Maratea, Mario Alviano, Mário Florido, Marius Schneider, Martin Gebser, Masakazu Ishihata, Massimiliano Cattafi, Matthias Knorr, Maurice Bruynooghe, Max Ostrowski, Michael Bartholomew, Michael Hanus, Michael Morak, Minh Dao-Tran, Mutsunori Banbara, Naoki Nishida, Naoyuki Tamura, Neda Saeedloei, Nicola Capuano, Nicolas Schwind, Noson Yanofsky, Nysret Musliu, Orkunt Sabuncu, Pablo Chico De Guzmán Paolo Torroni, Paul Tarau, Peter James Stuckey, Peter Schüller, Philipp Obermeier, Puri Arenas-Sanchez, Rémy Haemmerlé, Rafael Del Vado Virsela, Ricardo Rocha, Richard Min, Robert Craven, Roland Kaminski, Samir Genaim, Sandeep Chintabathina, Santiago Escobar, Sara Girotto, Sean Policarpio, Simona Perri, Slim Abdennadher, Sofia Gomes, Stefania Costantini, Stefano Bistarelli, Thomas Krennwallner, Thomas Ströder, Tomoya Tanjo, Torben Mogensen, Umut Oztok, Valerio Senni, Victor Marek, Victor Pablos Ceruelo, Wolfgang Dvořák, Wolfgang Faber, Yana Todorova, and Yunsong Meng.

Throughout this period, we could always rely on ALP. Our gratitude goes to the ALP president Gopal Gupta, to the Conference chair Manuel (Manolo) Carro, and to all the ALP Executive committe members. We already thanked the invited speakers and the tutorialist above, but we would like to stress here our thank to them. David Tranah (Cambridge) and Ilkka Niemelä (TPLP editor) deserve our thanks for their kindness and their precious support in all publication stages. Similarly, a thanks goes to Marc Herbstritt from Dagstuhl, Leibniz Center for Informatics, for the support in publication of the Technical Communication.

Our thanks also go to the the sponsors of the meeting, namely the Association for Logic Programming (ALP), the Artificial Intelligence Section of the John von Neumann Computer Society, the Aquincum Institute of Technology (AIT) of Budapest, Alerant System Inc, and Google (female researchers grant). Finally, a well-deserved thank you goes to Easychair developers and managers. This amazing free software allowed us to save days of low level activities. Similarly, the joint work of the two co-chairs would have been extremely more difficult and expensive without the Dropbox and Skype services.

September 2012 Agostino Dovier and Vítor Santos Costa Program Committee Chairs and Guest Editors This electronic appendix reports the contents of the Volume 17, Issue 1 (DOI 10.4230/LIPIcs.ICLP.2012.42) of the Leibniz International Proceedings in Informatics (LIPIcs) series, published on-line through the Dagstuhl Research Online Publication Server (DROPS) publishing position papers, technical communications, and doctoral consortium contributed to the 28th International Conference on Logic Programming (ICLP 2012).

Position Paper

Simulation Unification: Beyond Querying Semistructured Data François Bry, Sebastian Schaffert

Technical Communication

A Logic Programming approach for Access Control over RDF
Nuno Lopes, Sabrina Kirrane, Antoine Zimmermann, Axel Polleres and
Alessandra Mileo

Modeling Machine Learning and Data Mining Problems with FO(·)

Hendrik Blockeel, Bart Bogaerts, Maurice Bruynooghe, Broes De Cat,

Stef De Pooter, Marc Denecker, Anthony Labarre, Jan Ramon and Sicco

Verwer.

Paving the Way for Temporal Grounding
Felicidad Aguado, Pedro Cabalar, Martín Diéguez, Gilberto Pérez and
Concepcion Vidal.

Preprocessing of Complex Non-Ground Rules in Answer Set Programming Michael Morak and Stefan Woltran.

Two-Valued Logic Programs Vladimir Lifschitz.

LOG-IDEAH: ASP for Architectonic Asset Preservation

Marina De Vos. Julian Padqet, Vivana Novelli and Dina D'Ayala.

aspeed: ASP-based Solver Scheduling

Holger Hoos, Roland Kaminski, Torsten Schaub and Marius Schneider.

Static Type Inference for the Q language using Constraint Logic Programming Zsolt Zombori, János Csorba and Péter Szeredi.

ASP at Work: An ASP Implementation of PhyloWS

Enrico Pontelli, Tiep Le, Hieu Nguyen and Tran Cao Son.

Improving Quality and Efficiency in Home Health Care: an application of Constraint Logic Programming for the Ferrara NHS unit

Massimiliano Cattafi, Rosa Herrero, Marco Gavanelli, Maddalena Nonato and Juan José Ramos Gonzalez.

An FLP-Style Answer-Set Semantics for Abstract-Constraint Programs with Disjunctions

Johannes Oetsch, Jörg Pührer and Hans Tompits.

A Tarskian Semantics for Answer Set Programming

Marc Denecker, Yuliya Lierler, Mirek Truszczynski and Joost Vennekens.

Lazy model expansion by incremental grounding Broes De Cat, Marc Denecker and Peter Stuckey.

Logic + control: An example Włodek Drabent.

Tabling for infinite probability computation Taisuke Sato and Philipp Meyer.

Improving Lazy Non-Deterministic Computations by Demand Analysis $\it Michael\ Hanus.$

Surviving Solver Sensitivity: An ASP Practitioner's Guide Bryan Silverthorn, Yuliya Lierler and Marius Schneider.

On the Termination of Logic Programs with Function Symbols Sergio Greco, Francesca Spezzano and Irina Trubitsyna.

Towards Testing Concurrent Objects in CLP Elvira Albert, Puri Arenas and Miguel Gomez-Zamalloa.

Generating Event-Sequence Test Cases by Answer SetProgramming with the Incidence Matrix

Mutsunori Banbara, Naoyuki Tamura and Katsumi Inoue.

Answer Set Solving with Lazy Nogood Generation Christian Drescher and Toby Walsh.

Reconciling Well-Founded Semantics of DL-Programs and AggregatePrograms

Jia-Huai You, John Morris and Yi Bi.

Stable Models of Formulas with Generalized Quantifiers Joohyung Lee and Yunsong Meng.

Extending C+ with Composite Actions for Robotic Task Planning Xiaoping Chen, Guoqiang Jin and Fangkai Yang.

Deriving a Fast Inverse of the Generalized Cantor N-tupling Bijection *Paul Tarau*.

Unsatisfiability-based optimization in clasp
Benjamin Andres, Benjamin Kaufmann, Oliver Matheis and Torsten
Schaub.

Visualization of Constraint Handling Rules through Source-to-Source Transforma-

Slim Abdennadher and Nada Sharaf.

Applying Machine Learning Techniques to ASP Solving Marco Maratea, Luca Pulina and Francesco Ricca.

Flexible Solvers for Finite Arithmetic Circuits Nathaniel Filardo and Jason Eisner.

The additional difficulties for the automatic synthesis of specifications posed by logic features in functional-logic languages

Giovanni Bacci, Marco Comini, Marco A. Feliú and Alicia Villanueva.

Answering Why and How questions with respect to a frame-based knowledge base: a preliminary report

Shanshan Liang, Nguyen Ha Vo and Chitta Baral.

Logic Programming in Tabular Allegories

Emilio Jesús Gallego Arias and James B. Lipton.

Possibilistic Nested Logic Programs

Juan Carlos Nieves and Helena Lindgren.

Using Answer Set Programming in the Development of Verified Software Florian Schanda and Martin Brain.

An Answer Set Solver for non-Herbrand Programs: Progress Report

Marcello Balduccini.

CHR for Social Responsibility

Veronica Dahl, Bradley Coleman, Emilio Miralles and Erez Maharshak.

A Concurrent Operational Semantics for Constraint Functional Logic Programming Rafael Del Vado Vírseda, Fernando Pérez Morente and Marcos Miguel García Toledo.

Doctoral Consortium Contributions

Software Model Checking by Program Specialization $Emanuele\ De\ Angelis$

Temporal Answer Set Programming

Martín Diéguez

A Gradual Polymorphic Type System with Subtyping for Prolog $Spyros\ Hadjichristodoulou$

ASP modulo CSP: The clingcon system Max Ostrowski

An ASP Approach for the Optimal Placement of the Isolation Valves in a Water Distribution System

Andrea Peano

Answer Set Programming with External Sources $Christoph\ Redl$

Together, Is Anything Possible? A Look at Collective Commitments for Agents $Ben\ Wright$