Introduction to the 33rd international conference on logic programming special issue

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This special issue of Theory and Practice of Logic Programming (TPLP) contains the regular papers accepted for presentation at the 33rd International Conference on Logic Programming (ICLP 2017), held in Melbourne, Australia from the 28th of August to the 1st of September, 2017. ICLP 2017 was colocated with the 23rd International Conference on Principles and Practice of Constraint Programming (CP 2017) and the 20th International Conference on Theory and Applications of Satisfiability Testing (SAT 2017). Since the first conference held in Marseille in 1982, ICLP has been the premier international event for presenting research in logic programming. Contributions to ICLP are sought in all areas of logic programming, including:

- *Theory* – Semantic Foundations, Formalisms, Nonmonotonic Reasoning, Knowledge Representation.
- *Implementation* – Compilation, Virtual Machines, Parallelism, Constraint Handling Rules, Tabling.
- *Environments* – Program Analysis, Transformation, Validation, Verification, Debugging, Profiling, Testing.
- *Language Issues* – Concurrency, Objects, Coordination, Mobility, Higher Order, Types, Modes, Assertions, Programming Techniques.
- *Related Paradigms* – Inductive and Co-inductive Logic Programming, Constraint Logic Programming, Answer-Set Programming, SAT-Checking.
- *Applications* – Databases, Big Data, Data Integration and Federation, Software Engineering, Natural Language Processing, Web and Semantic Web, Agents, Artificial Intelligence, Bioinformatics, and Education.

Three kinds of submissions were accepted:

- *Technical papers*, for technically sound, innovative ideas that can advance the state of logic programming.
- *Application papers*, that impact interesting application domains;
- *System and tool papers*, which emphasize novelty, practicality. usability, and availability of the systems and tools described.

This year, ICLP adopted the hybrid publication model used in all recent editions of the conference, with journal papers and Technical Communications (TCs), following a decision made in 2010 by the Association for Logic Programming. Papers of the highest quality were selected to be published as *rapid publications* in this special issue of TPLP. The TCs comprise papers which the Program Committee (PC) judged of good quality but not yet of the standard required to be accepted and published in TPLP as well as dissertation project descriptions stemming from the Doctoral Program (DP) held with ICLP.

We received 72 submissions of abstracts, of which 55 resulted in full submissions. The Program Chairs, acting as guest editors of the special issue, organized the refereeing process, which was undertaken by the PC with the support of external reviewers. Each paper was reviewed by at least three referees who provided detailed written evaluations. This enabled a list of papers to be short-listed as candidates for rapid communication. The authors of these papers revised their submissions in light of the reviewers' suggestions, and all these papers were subject to a second round of reviewing. Of these candidates papers, 21 were accepted as rapid communications, to appear in the special issue. In addition, the PC recommended 13 papers to be accepted as TCs, of which 11 were also presented at the conference (2 were withdraw). These TCs, together with the presentations from the Doctoral Consortium, were published by Dagstuhl Publishing in Volume 58 of their OpenAccess Series in Informatics (OASIcs), available at `http://www.dagstuhl.de/oasics`. The 21 rapid communications that appear in this special issue are listed below, in alphabetical order of the first author:

- María Alpuente, Angel Cuenca-Ortega, Santiago Escobar and Julia Sapiña. *Inspecting Maude Variants with GLINTS (Tool paper)*.
- Mario Alviano. *Model enumeration in propositional circumscription via unsatisfiable core analysis*.
- Giovanni Amendola, Nicola Leone and Marco Manna. *Finite model reasoning over existential rules*.
- Harald Beck, Thomas Eiter and Christian Folie. *Ticker: A System for Incremental ASP-based Stream Reasoning*.
- Zhuo Chen, Elmer Salazar, Kyle Marple, Lakshman Tamil, Gopal Gupta, Sandeep Das and Alpesh Amin. *Improving Adherence to Heart Failure Management Guidelines via Abductive Reasoning*.
- Bernardo Cuteri, Carmine Dodaro, Francesco Ricca and Peter Schller. *Constraints, Lazy Constraints, or Propagators in ASP Solving: An Empirical Analysis*.
- Marco Gavanelli, Maddalena Nonato, Andrea Peano and Davide Bertozzi. *Logic Programming approaches for routing fault-free and maximally-parallel Wavelength Routed Optical Networks on Chip (Application paper)*.
- Guido Governatori and Michael Maher. *Annotated Defeasible Logic*.
- Ricardo Gonçalves, Matthias Knorr, Joao Leite and Stefan Woltran. *When You Must Forget: beyond strong persistence when forgetting in answer set programming*.

- Amelia Harrison, Vladimir Lifschitz and Dhananjay Raju. *Program Completion in the Input Language of GRINGO*.
- Tomi Janhunen, Roland Kaminski, Max Ostrowski, Torsten Schaub, Sebastian Schellhorn and Philipp Wanko. *Clingo goes Linear Constraints over Reals and Integers*.
- Jianmin Ji, Fangfang Liu and Jia-Huai You. *Well-Founded Operators for Normal Hybrid MKNF Knowledge Bases*.
- Ekaterina Komendantskaya and Yue Li. *Productive Corecursion in Logic Programming*.
- Joohyung Lee, Nikhil Loney and Yunsong Meng. *Representing Hybrid Automata by Action Language Modulo Theories*.
- Joohyung Lee, Samidh Talsania and Yi Wang. *Computing LPMLN Using ASP and MLN Solvers*.
- Vladimir Lifschitz. *Achievements in Answer Set Programming*.
- Panos Rondogiannis and Ioanna Symeonidou. *The Intricacies of 3-Valued Extensional Semantics for Higher-Order Logic Programs*.
- Alejandro Serrano and Jurriaan Hage. *Constraint Handling Rules with Binders, Patterns and Generic Quantification*.
- Farhad Shakerin, Elmer Salazar and Gopal Gupta. *A New Algorithm to Automate Inductive Learning of Default Theories*.
- Ibrahim Faruk Yalciner, Ahmed Nouman, Volkan Patoglu and Esra Erdem. *Hybrid Conditional Planning using Answer Set Programming*.
- Carlo Zaniolo, Mohan Yang, Matteo Interlandi, Ariyam Das, Alexander Shkapsky and Tyson Condie. *Fixpoint Semantics and Optimization of Recursive Datalog Programs with Aggregates*.

After consultation with the PC, the paper "*The Intricacies of 3-Valued Extensional Semantics for Higher-Order Logic Programs*" was awarded the *best paper prize*, and the paper "*Finite model reasoning over existential rules*" was awarded the *best student paper prize*. The best papers were selected by the PC from those submissions with the joint highest aggregate score, as assigned by the reviewers. Each member of the PC was awarded 4 marks that they could divide between these candidate papers. The best student paper was selected likewise.

In addition to the presentations of accepted papers, the technical program of ICLP 2017 included five invited talks:

- Agostino Dovier (University of Udine, Italy). *The role of SAT, CP, and Logic Programming in Computational Biology*;
- Holger H. Hoos (Leiden Institute of Advanced Computer Science and University of British Columbia, Canada). *The best of both worlds: Machine learning meets logical reasoning*;
- Nina Narodytska (VMware Research, USA). *Recent advances in Maximum Satisfiability*;
- Enrico Pontelli (New Mexico State University, USA). *Back to the Future - Parallelism and Logic Programming*; and
- Mark Wallace (Monash University and Opturion, Australia). *Constraints and the 4th Industrial Revolution*.

and the tutorials:

- Guido Tack (Monash University, Australia). *Introduction to Constraint Programming - If You Already Know SAT or Logic Programming*;
- Armin Biere (Johannes Kepler University Linz, Austria). *An Introduction to Satisfiability*;
- Tias Guns (Vrije Universiteit Brussel, Belgium). *Introduction to Machine Learning and Data Science*; and
- Pietro Belotti (FICO, UK). *Mixed Integer Nonlinear Programming: An Introduction.*

as well as two *Test-of-Time award* presentations:

- Alex Dekhtyar and V.S. Subrahmanian. *Hybrid Probabilistic Programs.* Proceedings of 1997 International Conference on Logic Programming, Leuven, Belgium, pp. 391-405. MIT Press.
- Jorge Navas, Edison Mera, Pedro López-García, and Manuel V. Hermenegildo. *User-Definable Resource Bounds Analysis for Logic Programs.* Proceedings of the 23rd International Conference on Logic Programming, ICLP 2007, Porto, Portugal, September 8–13, 2007. Lecture Notes in Computer Science 4670, Springer 2007, pp. 348–363.

The Test-of-Time papers were ranked by using citations as a proxy for impact. The web portals Scopus, Web of Science, Semantic Scholar and Google Scholar were used for collecting citations; care was taken to remove self-citations and check for citations that were split between a conference paper and a follow-up journal paper. The conference technical program was augmented by the already traditional Doctoral Program, organized by Neda Saeedloei and Christopher Mears, and by several pre-conference workshops.

We would like to thank the organizers of these affiliated events for their contributions to the conference as a whole. We are of course also deeply indebted to the Program Committee members and external reviewers, as the conference would not have been possible without their dedicated, enthusiastic and outstanding work. The Program Committee members were:

Mario Alviano	Wolfgang Faber	Ekaterina
Marcello Balduccini	Thom Fruehwirth	Komendantskaya
Pedro Cabalar	Sarah Alice Gaggl	Joohyung Lee
Mats Carlsson	Graeme Gange	Michael Leuschel
Manuel Carro	Maria Garcia De La	Vladimir Lifschitz
Michael Codish	Banda	Alessandra Mileo
Alessandro Dal Pal	Marco Gavanelli	Enrico Pontelli
Broes De Cat	Martin Gebser	C. R. Ramakrishnan
Marina De Vos	Gopal Gupta	Francesco Ricca
Marc Denecker	Amelia Harrison	Ricardo Rocha
Agostino Dovier	Manuel V. Hermenegildo	Alessandra Russo
Ins Dutra	Tomi Janhunen	Chiaki Sakama
Esra Erdem	Andy King	Tom Schrijvers

Tran Cao Son	Daniele Theseider Dupre'	Stefan Woltran
Theresa Swift	Mirek Truszczynski	Jia-Huai You
Guido Tack	German Vidal	Neng-Fa Zhou
Paul Tarau	Jan Wielemaker	

The external reviewers were:

Joaquin Arias	Georgios Karachalias	Javier Romero
Marc Bezem	Arash Karimi	Elmer Salazar
Bernhard Bliem	Michael Kifer	Vitor Santos Costa
Zhuo Chen	Ruben Lapauw	Lukas Schweizer
Jonnathan Cook	Thomas Linsbichler	Farhad Shakerin
Bernardo Cuteri	Fangfang Liu	Nada Sharaf
Fabio Aurelio D'Asaro	Yanhong A. Liu	Roni Stern
Ingmar Dasseville	Kyle Marple	Alwen Tiu
Besik Dundua	Michael Morak	Matthias van der Hallen
Andrea Formisano	Jose F. Morales	Alicia Villanueva
Michael Frank	Falco Nogatz	Yi Wang
Daniel Gall	Adrian Palacios	Philipp Wanko
Jianmin Ji	Le Thi Anh Thu Pham	Zhun Yang