Introduction to the 34-th international conference on logic programming special issue

ALESSANDRO DAL PALÙ
Dept. Mathematical, Physical and Computer Sciences
University of Parma, Parco Area delle Scienze 53/A, Parma 43124, Italy
(e-mail: alessandro.dalpalu@unipr.it)

PAUL TARAU
Dept. of Computer Science and Engineering, University of North Texas
1155 Union Circle, Denton, Texas 76203, USA
(e-mail: paul.tarau@unt.edu)

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This special issue of Theory and Practice of Logic Programming (TPLP) contains the regular papers accepted for presentation at the 34-th International Conference on Logic Programming (ICLP 2018), held in Oxford, United Kingdom, from July 14th to July 17th, 2018.

ICLP 2018 was part of the Federated Logic Conference 2018, (FLOC 2018), as the premier conference on foundations and applications of logic programming, including but not restricted to answer-set programming, non-monotonic reasoning, unification and constraints based logic languages, constraint handling rules, argumentation logics, deductive databases, description logics, inductive and co-inductive logic programming.

Papers were solicited on:

- **Foundations**: semantics, execution algorithms, formal models.
- **Implementation**: virtual machines, compilation, memory management, parallel execution, foreign interfaces.
- **Language Design**: inference engines, type systems, concurrency and distribution, modules, metaprogramming, relations to object-oriented and functional programming, logic-based domain-specific languages.
- **Software-Development Techniques**: declarative algorithms and data structures, design patterns, debugging, testing, profiling, execution visualization.
- **Transformation and Analysis**: assertions, type and mode inference, partial evaluation, abstract interpretation, program transformations.
- **Applications and Synergies**: interaction with SAT, SMT and CSP solvers, logic programming techniques for type inference and theorem proving, horn-clause analysis, knowledge representation, cognitive computing, artificial intelligence, natural language processing, information retrieval, web programming, education, computational life sciences, computational mathematics.

Three kinds of submissions were accepted:

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

In addition to the presentations of accepted papers, the technical program has included invited talks, the doctoral consortium, and several workshops.

ICLP implemented 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 have received 63 submissions of abstracts, of which 49 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, 25 were accepted as rapid communications, to appear in the special issue. In addition, the PC recommended 15 papers to be accepted as TCs, of which 14 were also presented at the conference (1 was withdrawn). These TCs, together with the presentations from the Doctoral Consortium, were published by Dagstuhl Publishing in Volume 64 of their OpenAccess Series in Informatics (OASiCs), available at http://www.dagstuhl.de/oasics. The 25 rapid communications that appear in this special issue are listed below, in alphabetical order of the first author:

• Mario Alviano, Carmine Dodaro and Marco Maratea. Shared aggregate sets in answer set programming
• Mario Alviano, Carmine Dodaro, Matti Järvisalo, Marco Maratea and Alessandro Previti. Cautious Reasoning in ASP via Minimal models and Unsatisfiable Cores
• Joaquín Arias, Manuel Carro, Elmer Salazar, Kyle Marple and Gopal Gupta. Constraint Answer Set Programming without Grounding
• George Baryannis, Ilias Tachmazidis, Sotiris Batsakis, Grigoris Antoniou, Mario Alviano, Timos Sellis and Pei-Wei Tsai. A Trajectory Calculus for Qualitative Spatial Reasoning Using Answer Set Programming
• Angela Bonifati, Stefania Dumbrava and Emilio Jesús Gallego Arias. Certified Graph View Maintenance with Regular Datalog
• Pedro Cabalar, Jorge Fandiño, Luis Fariñas Del Cerro and David Pearce. Functional ASP with Intensional Sets; Application to Gelfond-Zhang Aggregates
• Pedro Cabalar, Roland Kaminski, Torsten Schaub and Anna Schuhmann. Temporal Answer Set Programming on Finite Traces
• Angelos Charalambidis, Panos Rondogiannis and Ioanna Symeonidou. Approximation Fixpoint Theory and the Well-Founded Semantics of Higher-Order Logic Programs
After consultation with the PC, the paper *Exploiting Answer Set Programming with External Sources for Meta-Interpretive Learning* by Tobias Kaminski, Thomas Eiter and Katsumi Inoue was awarded the best paper prize. The best paper was 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 2 marks that they could divide between these candidate papers. In addition to the presentations of accepted papers, the technical program of ICLP 2018 included two invited talks:

- **Elvira Albert.** Avoiding redundancies in the exploration of concurrent programs
- **Thomas Eiter.** Answer Set Programs go 30: Past and Future
The conference technical program was augmented by two Test-of-Time papers, the Doctoral Program, organized by Paul Fodor and Neda Saeedloei, and by several workshops. 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.

We would like to thank the organizers of these affiliated events for their contributions to the conference as a whole. We are 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:

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- Mutsunori Banbara
- Manuel Carro
- Marina De Vos
- Thom Frühwirth
- Gopal Gupta
- Manuel Hermenegildo
- Ekaterina Komendantskaya
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- Mirek Truszczyński
- Stefan Woltran
- Neng-Fa Zhou
- Hassan Aït-Kaci
- Pedro Cabalar
- Michael Codish
- Thomas Eiter
- Marco Gavanelli
- Michael Hanus
- Tomi Janhunen
- Nicola Leone
- Vladimir Lifschitz
- Enrico Pontelli
- Vitor Santos Costa
- Theresa Swift
- German Vidal
- Roland Yap
- Marcello Balduccini
- Mats Carlsson
- Alessandro Dal Palù
- Esra Erdem
- Martin Gebser
- Amelia Harrison
- Angelika Kimmig
- Michael Leuschel
- Barry O’Sullivan
- Ricardo Rocha
- Tom Schrijvers
- Peter Szeredi
- Jan Wielemaker
- Jia-Huai You

The external reviewers were:

- Weronika T. Adrian
- João Barbosa
- Carmine Dodaro
- František Farka
- Daniel Gall
- Markus Hecher
- Jan Maly
- Michael Morak
- Javier Romero
- Sebastian Schellhorn
- Nada Sharaf
- Pedro Vasconcelos
- Philipp Wanko
- Sandra Alves
- Zhuo Chen
- Gregory Duck
- Mário Florido
- Gregory Gelfond
- Arash Karimi
- Fumio Mizoguchi
- Falco Nogatz
- Elmer Salazar
- Peter Schüller
- Jon Sneyers
- Alicia Villanueva
- Fangkai Yang
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- Wolfgang Faber
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