Technical Communications of the 34th International Conference on Logic Programming

ICLP 2018, July 14–17, 2018 ,Oxford, United Kingdom

Edited by

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ICLP 2018: Doctoral Consortium

Preface

This volume contains the Technical Communications and the Doctoral Consortium papers of 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.

Contributions to ICLP are sought in all areas of logic programming, including:

- **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.

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

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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). 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:

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

The external reviewers were:

Weronika T. Adrian	Sandra Alves	Joaquín Arias
João Barbosa	Zhuo Chen	Md Solimul Chowdhury
Carmine Dodaro	Gregory Duck	Wolfgang Faber
František Farka	Mário Florido	Michael Frank
Daniel Gall	Gregory Gelfond	Jurriaan Hage
Markus Hecher	Arash Karimi	Emily Leblanc
Jan Maly	Fumio Mizoguchi	Eric Monfroy
Michael Morak	Falco Nogatz	Adrian Palacios
Javier Romero	Elmer Salazar	Zeynep Saribatur
Sebastian Schellhorn	Peter Schüller	Farhad Shakerin
Nada Sharaf	Jon Sneyers	Finn Teegen
Pedro Vasconcelos	Alicia Villanueva	Yisong Wang
Philipp Wanko	Fangkai Yang	

The 14th Doctoral Consortium (DC) on Logic Programming was held in conjunction with ICLP 2018 and FLoC 2018. It attracts Ph.D. students in the area of Logic Programming Languages from different backgrounds (e.g. theoretical, implementation, application) and encourages a constructive and fruitful advising. Topics included: theoretical foundations of logic and constraint logic programming, sequential and parallel implementation technologies, static and dynamic analysis, abstract interpretation, compilation technology, verification, logic-based paradigms (e.g., answer set programming, concurrent logic programming, inductive logic programming) and innovative applications of logic programming. This year the Doctoral Consortium accepted ten papers in the areas described above: 5 in Logical Systems, 1 in Implementations and 4 in Applications of logic programming. We warmly thank all

student authors, supervisors, referees, co-chairs, members of the program committee and the organizing team that made the Doctoral Consortium greatly successful.

The accepted papers were:

- Yi Wang. Probabalistic Action Language pBC+
- Emily Leblanc. Explaining Actual Causation via Reasoning about Actions and Change
- Zhun Yang. Translating P-log, LP^{MLN}, LPOD, and CR-Prolog2 into Standard Answer Set Programs
- Frantisek Farka. Proof-relevant resolution for elaboration of programming languages
- Arindam Mitra. The Learning-Knowledge-Reasoning Paradigm For Natural Language Understanding and Question Answering
- Richard Taupe. Speeding Up Lazy-Grounding Answer Set Solving
- Tiantian Gao. Knowledge Acquisition and Question Answering via Controlled Natural Language
- Van Nguyen. Natural Language Generation From Ontologies
- Filipe Gouveia, Ines Lynce and Pedro T. Monteiro. Model Revision of Logical Regulatory Networks using Logic-based Tools
- Philipp Obermeier. Scalable Robotic Intra-Logistics with Answer Set Programming

The DC Program Committee members were:

Marina De Vos, University of Bath
Fabio Fioravanti, University of Chieti-Pescara
Martin Gebser, Aalto University
Jose F. Morales, IMDEA Software Research Institute
Takehide Soh, Information Science and Technology Center, Kobe University
Frank D. Valencia LIX, Ecole Polytechnique
Neda Saeedloei, Southern Illinois University Carbondale
Paul Fodor, Stony Brook University

We would also like to express our gratitude to the full ICLP 2018 organization committee, namely Marco Gavanelli who acted as general chair; Stefan Woltran, who served as workshop chair; Enrico Pontelli, who acted as publicity chair and designed the web pages; Paul Fodor and Neda Saeedloei, who jointly chaired the Doctoral Program of ICLP; and Paul Fodor, who organized the programming contest. Our gratitude must be extended to Torsten Schaub, who is serving in the role of President of the Association of Logic Programming (ALP), to all the members of the ALP Executive Committee and to Mirek Truszczyński, Editor-in-Chief of TPLP. Also, to the staff at Cambridge University Press, especially Richard Horley, and to the personnel at Schloss Dagstuhl-Leibniz Zentrum fur Informatik, especially Michael Wagner, for their assistance. We would also like to thank the staff of the EasyChair conference management system for helping the Program Chairs with their prompt support. We wish to thank each author of every submitted papers, since their efforts keep the conference alive and the participants to ICLP for bringing and sharing their ideas and latest developments.

Finally, we would like to thank the FLOC 2018 conference general chair: Moshe Y. Vardi and to the FLOC 2018 co-chairs Daniel Kroening and Marta Kwiatkowska for their help and guidance to make ICLP part of this outstanding scientific event.

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