Lecture Notes in Computer Science 1559
Edited by G. Goos, J. Hartmanis and J. van Leeuwen

Springer
Berlin
Heidelberg
New York
Barcelona
Hong Kong
London
Milan
Paris
Singapore
Tokyo

Pierre Flener (Ed.)

Logic-Based Program Synthesis and Transformation

8th International Workshop, LOPSTR'98
Manchester, UK, June 15-19, 1998
Selected Papers

Springer

Volume Editor

Pierre Flener
Department of Information Science, Uppsala University
Box 311, S-751 05 Uppsala, Sweden
E-mail: pierref@csd.uu.se

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Logic-based program synthesis and transformation : 8th international workshop ; selected papers / LOPSTR '98, Manchester, UK, June 15 - 19, 1998. Pierre Flener (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ; Paris ; Singapore ; Tokyo : Springer, 1999
(Lecture notes in computer science ; Vol. 1559)
ISBN 3-540-65765-7

CR Subject Classification (1998): F.3.1, D.1.1, D.1.6, I.2.2, F.4.1

ISSN 0302-9743
ISBN 3-540-65765-7 Springer-Verlag Berlin Heidelberg New York

Typesetting: Camera-ready by author
SPIN 10702874 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Preface

LOPSTR'98 (see http://www.csd.uu.se/∼pierref/lopstr98/) was the 8th edition of the LOPSTR workshop series (see http://www.cs.man.ac.uk/∼kung-kiu/lopstr/). In order to reflect the current emphasis on computational logic, the series was renamed *Logic-based Program Synthesis and Transformation*, as opposed to the former Logic Program Synthesis and Transformation. This means that papers on *any* computational-logic-based techniques, languages, and tools for the interactive or automated development of *any* kinds of programs were now solicited. There was also strong encouragement to submit papers discussing programming-in-the-large issues or practical applications.

The selection process ran in three phases. First, based on the submitted 36 extended abstracts, the programme committee invited 27 author teams to present their research at the workshop; pre-workshop proceedings with the accepted abstracts were available as a technical report (see ftp://ftp.cs.man.ac.uk/pub/TR/UMCS-98-6-1.html). The revised and extended scope triggered abstracts from all continents, including 50% from outside the "usual geographic sphere of influence" of LOPSTR. Also, 66% of these abstracts were written by first-time LOPSTR author teams. These figures seem to prove the effectiveness of the changes operated by the 1998 programme committee. Secondly, shortly after the workshop, the programme committee invited the authors of the 24 most promising abstracts and presentations to submit full papers. Thirdly, after a round of conference-level refereeing, the 16 best full papers were included in this volume, which constitutes thus the post-workshop proceedings. Another 8 short papers appear in this volume, written by the invited speaker (see below), by authors who voluntarily refrained from writing the solicited full paper, and by authors whose full papers were not accepted (they appear in no particular order).

As a workshop, LOPSTR'98 continued the tradition of being a lively and friendly forum for presenting recent and current research, as well as discussing future trends in the synthesis and transformation of programs. There were nine sessions, called Specification, Synthesis, Transformation, Analysis, Synthesis & Schemas, Verification, Specialisation, Composition & Reuse, and Industrial Applications, hence covering larger ground than usual, with the first (massive) appearance of papers exploiting constraint technology, discussing pragmatics and real-life applications, addressing specification language issues, or covering component-based software development.

The invited speaker was Pierre Wolper, of the Université de Liège in Belgium. He discussed his perspective on algorithms for synthesising reactive systems, by first reviewing the main results from that area and then, provocatively, but in a down-to-earth manner, trying to identify the main reasons for their non-exploitation.

Steve Roach (NASA Ames) went through many iterations of a very impressive demonstration of the AMPHION program synthesiser (see http://ic-www.arc.nasa.gov/ic/projects/amphion/), showing how it is, for instance, in day-to-day use at NASA for generating, through much reuse, programs from

graphical specifications provided by space scientists who have no background in computational logic or software engineering.

LOPSTR'98 was organised by the Department of Computer Science of the University of Manchester, and took place in parallel to JICSLP'98 (the *Joint International Conference and Symposium on Logic Programming*), from 15 to 19 June 1998. Delegates to one event could freely attend all sessions of the other event. Many of the JICSLP'98 participants were frequently observed to prefer the LOPSTR'98 sessions.

LOPSTR'98 also coincided with the celebrations of the 50th anniversary of the world's first stored-program computer, the *Baby*, built at Manchester in 1948 (see http://www.computer50.org/). The delegates had the opportunity to attend a promenade concert given by the Halle Orchestra, as well as the magnificent *Golden Anniversary Celebration* at the Bridgewater Hall. The latter featured a dramatic reconstruction of the invention of the Baby, the switching-on of a replica of the Baby by its original co-builder Prof. Tom Kilburn, lively presentations by UK industry leaders about the role of computers in the future, and the conferral of several honorary degrees.

The future of LOPSTR and its possible rapprochement with the IEEE international conferences on *Automated Software Engineering* (ASE, formerly KBSE: *Knowledge-Based Software Engineering*, see http://www.sigart.acm.org/ Conferences/ase/past/) were discussed in the JICSLP'98 post-conference workshop on *Automated Software Engineering and Logic Programming*. See http://www.cs.man.ac.uk/∼kung-kiu/ase-lp/ for the record of this meeting.

LOPSTR'98 was sponsored by the Association for Logic Programming, the ESPRIT Network of Excellence in Computational Logic, and the Prolog Development Center, whose contributions are here gratefully acknowledged.

I also want to take this opportunity to formally thank the workshop chair, Kung-Kiu Lau, and his team, Ian Pratt and Lynn Howarth, for a fabulously smooth event. My thanks also go to Francesca Toni and David Pearce for their help, to the programme committee for invaluable assistance with the academic aspects of the workshop, including three rounds of refereeing, and to Norbert E. Fuchs, the chairman of LOPSTR'97, for his helpful advice.

December 1998

Pierre Flener
Programme Chair
LOPSTR'98

Programme Committee

Nicoletta Cocco	University of Venice, Italy
Pierre Flener (programme chair)	Uppsala University, Sweden
Andreas Hamfelt	Uppsala University, Sweden
Kung-Kiu Lau (workshop chair)	University of Manchester, UK
Baudouin Le Charlier	University of Namur, Belgium
Michael Leuschel	University of Southampton, UK
Michael Lowry	NASA Ames, USA
Ali Mili	Institute for Software Research, USA
Lee Naish	Melbourne University, Australia
Mario Ornaghi	University of Milan, Italy
Alberto Pettorossi	University of Rome II, Italy
Dave Robertson	University of Edinburgh, UK
Richard Waldinger	SRI International, USA

Reviewers

The following people helped the Programme Committee to review the papers: Richard Banach, Marco Benini, Annalisa Bossi, Agostino Cortesi, Stefania Costantini, Danny De Schreye, Yves Deville, Mauro Ferrari, Nevin Heintze, Gaetano Aurelio Lanzarone, Bern Martens, Ulrich Nitsche, Maurizio Proietti, Sophie Renault, Sabina Rossi, Matteo Vaccari, Sofie Verbaeten, Michael Winikoff, Hamza Zidoum.

Sponsors

Association for Logic Programming
ESPRIT Network of Excellence in Computational Logic
Prolog Development Center A/S, Brøndby-Copenhagen, Denmark

Table of Contents