Springer
Berlin
Heidelberg
New York
Barcelona
Hong Kong
London
Milan
Paris
Tokyo
Logic Based Program Synthesis and Transformation

11th International Workshop, LOPSTR 2001
Paphos, Cyprus, November 28-30, 2001
Selected Papers
Preface

This volume contains the papers from LOPSTR 2001, the 11th International Workshop on Logic-based Program Synthesis and Transformation. Topics of interest to LOPSTR cover all aspects of logic-based program development and, in particular, specification, synthesis, verification, transformation, specialization, analysis, optimization, composition, reuse, component-based software development, and software architectures.


LOPSTR 2001 was co-located with the 17th International Conference on Logic Programming (ICLP 2001)\(^1\) and the 7th International Conference on Principles and Practice of Constraint Programming (CP 2001)\(^2\). The LOPSTR community profited a lot from the scientific discussions, the lectures of the invited speakers, and the various sessions of ICLP and CP.

I would like to express my gratitude to all the authors of the submitted papers and all the attendees for their commitment and cooperation. Among the submitted papers, the Program Committee selected 13 papers for presentation. After the workshop, the authors were asked to submit improved versions of their papers which were then reviewed by the Program Committee. The final versions have been collected in this volume, which also includes the paper by our invited speaker, Natarajan Shankar (Stanford Research Institute, Menlo Park, USA), on the generation of efficient programs from logic.

My warmest thanks also go to all the members of the Program Committee and the additional reviewers for their diligent work and invaluable help. I would like to thank Fabio Fioravanti (IASI-CNR of Rome, Italy), Maurizio Proietti (IASI-CNR of Rome, Italy), and Antonis Kakas (University of Cyprus, Cyprus), who worked with me with great enthusiasm and dedication as members of the Organizing Committee.

The pre-proceedings of LOPSTR 2001 were printed by the IASI Institute of the National Research Council of Rome, Italy, and the Department of Computer Science of the University of Cyprus in Nicosia. I also thank Springer for accepting to publish these final proceedings in the LNCS series. The LOPSTR 2001 home page is: [http://www.iasi.rm.cnr.it/~adp/lopstr01_cfp.html](http://www.iasi.rm.cnr.it/~adp/lopstr01_cfp.html).

April 2002

Alberto Pettorossi

---


Program Chair

Alberto Pettorossi  Università degli Studi di Roma ‘Tor Vergata’, Italy

Program Committee

David Basin  Albert-Ludwigs-Universität Freiburg, Germany
Antonio Brogi  Università di Pisa, Italy
Maurice Bruynooghe  Katholieke Universiteit Leuven, Belgium
Nicoletta Cocco  Università Ca’ Foscari di Venezia, Italy
Mireille Ducassé  IRISA/INSA, France
Sandro Etalle  Twente University & CWI, The Netherlands
John Gallagher  University of Bristol, UK
Robert Glück  Waseda University, Japan
Michael Hanus  Christian-Albrechts-Universität zu Kiel, Germany
Manuel Hermenegildo  Universidad Politécnica de Madrid, Spain
Patricia Hill  University of Leeds, UK
Kung-Kiu Lau  University of Manchester, UK
Michael Leuschel  University of Southampton, UK
Torben Mogensen  University of Copenhagen, Denmark
Alberto Pettorossi  Università degli Studi di Roma ‘Tor Vergata’, Italy
I. V. Ramakrishnan  State University of New York at Stony Brook, USA
Don Sannella  University of Edinburgh, UK
Zoltan Somogyi  University of Melbourne, Australia

Additional Referees

José Alferes  Stefan Gruner  Sabina Rossi
Annalisa Bossi  Paul Jackson  Fausto Spoto
Luís Fernando Castro  Francis Klay  Mathieu Turuani
Alessandra Di Pierro  Giridhar Pemmasani  Wim Vanhoof
Yifei Dong  Maurizio Proietti
Fabio Fioravanti  Germán Puebla

Sponsoring Institutions

The Association for Logic Programming
The COLOG Net
The International Federation for Computational Logic
The IASI Institute of CNR (Italy)
Università degli Studi di Roma ‘Tor Vergata’ (Italy)
Table of Contents

Invited Speaker
Static Analysis for Safe Destructive Updates in a Functional Language ............................................ 1
Natarajan Shankar (SRI International, Menlo Park, USA)

Program Transformation and Equivalence
A Transformation Technique for Datalog Programs Based on Non-deterministic Constructs ......................... 25
Petros Potikas, Panos Rondogiannis (University of Athens, Greece), Manolis Gergatsoulis (Institute of Informatics & Telecommunications, Aghia Paraskevi Attikis, Greece)

On Deforesting Parameters of Accumulating Maps .................... 46
Kazuhiko Kakehi, Robert Glück, Yoshihiko Futamura (Waseda University, Tokyo, Japan)

Equivalence in Answer Set Programming.............................. 57
Mauricio Osorio, Juan A. Navarro, José Arrazola (Universidad de las Américas, Puebla, México)

Program Verificaion
Proof Theory, Transformations, and Logic Programming for Debugging Security Protocols ............................. 76
Giorgio Delzanno (University of Genova, Italy), Sandro Etalle (CWI and University of Twente, The Netherlands)

Abstract Conjunctive Partial Deduction Using Regular Types and Its Application to Model Checking ......................... 91
Michael Leuschel, Stefan Gruner (University of Southampton, United Kingdom)

Verification of Sets of Infinite State Processes Using Program Transformation .................................................. 111
Fabio Fioravanti (IASI-CNR, Rome, Italy), Alberto Pettorossi (University of Rome Tor Vergata, Italy), Maurizio Proietti (IASI-CNR, Rome, Italy)
Program Analysis

When Size Does Matter (Termination Analysis for Typed Logic Programs) ............................................ 129
  Wim Vanhoof, Maurice Bruynooghe (Katholieke Universiteit Leuven, Belgium)

Symbolic Profiling for Multi-paradigm Declarative Languages .............. 148
  Elvira Albert, Germán Vidal (Universidad Politécnica de Valencia, Spain)

Program Development

Correct Object-Oriented Systems in Computational Logic ................. 168
  Kung-Kiu Lau (University of Manchester, United Kingdom), Mario Ornaghi (University of Milan, Italy)

A Framework for Developing Embeddable Customized Logics .......... 191
  Sébastien Ferré (IRISA/CNRS, Rennes, France), Olivier Ridoux (IRISA/Université de Rennes 1, France)

Computing Environment-Aware Agent Behaviours with Logic Program Updates .......................................................... 216
  José J. Alferes (Universidade Nova de Lisboa, Portugal), Antonio Brogi (University of Pisa, Italy, Portugal), João A. Leite, Luís M. Pereira (Universidade Nova de Lisboa, Portugal)

Program Synthesis

Extracting General Recursive Program Schemes in Nuprl’s Type Theory .................................................. 233
  James L. Caldwell (University of Wyoming, Laramie, USA)

Extracting Exact Time Bounds from Logical Proofs ...................... 245
  Mauro Ferrari, Camillo Fiorentini, Mario Ornaghi (University of Milan, Italy)

Author Index .................................................. 267