Lecture Notes in Computer Science 1702
Edited by G. Goos, J. Hartmanis, and J. van Leeuwen

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

Gopalan Nadathur (Ed.)

Principles and Practice of Declarative Programming

International Conference, PPDP'99
Paris, France, September, 29 - October 1, 1999
Proceedings

Volume Editor

Gopalan Nadathur
The University of Chicago, Department of Computer Science
1100 East 58th Street, Chicago, IL 60637, USA
E-mail: gopalan@cs.uchicago.edu

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Principles and practice of declarative programming : proceedings / International Conference PPDP '99, Paris, France, September, 29 - October 1, 1999. Gopalan Nadathur (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ; Paris ; Singapore ; Tokyo : Springer, 1999
(Lecture notes in computer science ; Vol. 1702)
ISBN 3-540-66540-4

CR Subject Classification (1998): D.3, D.1, F.3

ISSN 0302-9743
ISBN 3-540-66540-4 Springer-Verlag Berlin Heidelberg New York

Typesetting: Camera-ready by author
SPIN: 10704567 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Preface

This volume contains the papers presented at the 1999 International Conference on Principles and Practice of Declarative Programming (PPDP'99) held in Paris from September 29 through October 1, 1999. PPDP'99 participated, together with the International Conference on Functional Programming (ICFP) and several related workshops, in a federation of colloquia known as Principles, Logics and Implementations of high-level programming languages (PLI'99). The overall event was organized by the Institut National de Recherche en Informatique et en Automatique (INRIA) and the ACM Special Interest Group for Programming Languages (ACM/SIGPLAN).

PPDP represents the union of two conferences that had been in existence for about a decade: Programming Languages, Implementations, Logics and Programs (PLILP) and Algebraic and Logic Programming (ALP). These conferences were held as one for the first time under the name PLILP/ALP in their tenth and seventh respective incarnations last year. The present rendition follows a decision by the combined steering committees to adopt a simpler name for the conference that also reflected the union. Continuing the tradition of PLILP/ALP, PPDP aims to stimulate research in the use of declarative methods in programming and on the design, application, and implementation of programming languages that support such methods. Topics of interest include the use of type theory, logics, and logical methods in understanding, defining, integrating, and extending programming paradigms such as those for functional, logic, object-oriented, constraint, and concurrent programming; support for modularity; the use of logics in the design of program development tools; development of implementation methods; and the application of the relevant paradigms and associated methods in industry and education. Many of these themes are reflected in the papers appearing in the present collection. Of particular note in these proceedings is the broad interpretation of declarative programming and the emphasis on both principles and practice in this area of research.

A few words about the selection of papers. Fifty-one full-length papers were received in response to the call for submissions. Each of these papers was reviewed by at least four individuals. The program committee met electronically in the last two weeks of April 1999 and, based on the reviews, selected 22 papers for presentation at the conference. A decision was also made during this meeting to include invited talks by Georges Gonthier (INRIA-Rocquencourt, France), Simon Peyton Jones (Microsoft Research, UK) and Pascal van Hentenryck (Catholic University of Louvain, Belgium), and tutorials by Chris Okasaki (Columbia University, USA) and Frank Pfenning (Carnegie Mellon University, USA) in the scientific program. These proceedings include all 22 contributed papers that were accepted, revised in accordance with the suggestions of the reviewers. Also included are papers that complement the presentations of Simon Peyton Jones and Pascal van Hentenryck and an abstract of the tutorial by

Frank Pfenning. Papers accompanying the remaining invited talk and tutorial were not received by the time of going to press.

Many people and institutions are to be acknowledged for their contributions to PPDP'99. The organization of this conference and PLI'99 would not have been possible but for the efforts of François Fages and Didier Rémy, the chairs of PPDP'99 and ICFP'99, and Annick Theis-Viemont and the INRIA staff. The quality of the technical program owes much to the diligence of the program committee members and the several referees whose help they enlisted. In addition to providing careful reviews of submitted papers, many of these individuals participated in extended discussions at the PC meeting towards ensuring consistency and accuracy in the selection process. At a financial level, PPDP'99 benefitted from a grant from the European Commission program for Training and Mobility of Researchers; this grant was mediated by the European Association for Programming Languages and Systems (EAPLS). Additional financial support was provided by the Centre National de la Recherche Scientifique (CNRS), CompulogNet, Microsoft Research, Ministère de l'Education Nationale, de la Recherche et de la Technologie (Gouv. France), Trusted Logic, and France Telecom. Finally, the meeting received an endorsement from the Association for Logic Programming.

July 1999 Gopalan Nadathur

Conference Organization

Conference Chair

François Fages, CNRS, ENS, Paris, France

Program Chair

Gopalan Nadathur, University of Chicago, USA

Program Committee

Martín Abadi	System Research Center, Compaq, Palo Alto, USA
Maria Alpuente	Universidad Politécnica de Valencia, Spain
Mats Carlsson	SICS, Sweden
Iliano Cervesato	Stanford University, USA
Bart Demoen	Katholieke Universiteit Leuven, Belgium
Sandro Etalle	Universiteit Maastricht, The Netherlands
François Fages	CNRS, ENS, Paris, France
Manuel Hermenegildo	Universidad Politécnica de Madrid, Spain
Patricia Hill	University of Leeds, UK
Joxan Jaffar	National University of Singapore, Singapore
Bharat Jayaraman	SUNY Buffalo, USA
Xavier Leroy	INRIA, Rocquencourt, France
Pierre Lescanne	ENS Lyon, France
Eugenio Moggi	University of Genova, Italy
Gopalan Nadathur	University of Chicago, USA
Tobias Nipkow	Technische Universität München, Germany)
Francesca Rossi	University of Padova, Italy
Harald Søndergaard	University of Melbourne, Australia
David S. Warren	SUNY Stony Brook, USA
Nobuko Yoshida	University of Sussex, UK

List of Referees

The following individuals and a few others who wished to remain anonymous have participated in the assessment of the manuscripts submitted to the conference:

Martín Abadi
Elvira Albert
Maria Alpuente
Roberto Bagnara
Richard Banach
Françoise Bellegarde
Zine-El-Abidine Benaissa
Brandon Bennett
Nick Benton
Roberto Bruni
Maurice Bruynooghe
Francisco Bueno
Daniel Cabeza
Mats Carlsson
Manuel Carro
Iliano Cervesato
Michael Codish
Vítor Santos Costa
Baoqiu Cui
Rowan Davies
Danny De Schreye
Pierpaolo Degano
Giorgio Delzanno
Bart Demoen
Marc Denecker
Rachid Echahed
Jesper Eskilson
Sandro Etalle
François Fages
Moreno Falaschi
Antonio J. Fernandez
Maribel Fernández
G. Ferrari
Cormac Flanagan
Matthew Flatt
Cedric Fournet
Fabio Gadducci
María García de la Banda
Simon Gay
Vincente Gisbert
Michael Hanus
Andrew Heaton
Nevin Heintze
Martin Henz
Manuel Hermenegildo
Angel Herranz
Carlos Herrero
Patricia Hill
Kohei Honda
Zhenjiang Hu
Joxan Jaffar
Gerda Janssens
Bharat Jayaraman
Wolfram Kahl
Antonios Kakas
Andy King
Shinji Kono
Per Kreuger
Frédéric Lang
Xavier Leroy
Pierre Lescanne
Francesca Levi
Mark D. Lillibridge
Luigi Liquori
Pedro López-García
Salvador Lucas
Luc Maranget
Julio Mariño
Kim Marriott
Michel Mauny
Guy McCusker
Aart Middeldorp
Dale Miller
Eugenio Moggi
Eric Monfroy
Juan José Moreno-Navarro
Gines Moreno-Valverde
Gopalan Nadathur
Wolfgang Naraschewski
Tobias Nipkow
Michael J. O'Donnell
Hitoshi Ohsaki
Mehmet Orgun
Catuscia Palamidessi
Benjamin C. Pierce
Enrico Pontelli
Frédéric Prost
Germán Puebla
María José Ramírez
Rafael Ramirez
Gianna Reggio
Pedro Resende
Christophe Ringeissen
Francesca Rossi
Salvatore Ruggieri
Claudio Vittorio Russo
Konstantinos Sagonas
David Sands
Ralf Schweimeier
Bernhard Schätz
Laura Semini
Manuel Serrano
Peter Sewell
Konrad Slind
Jan-Georg Smaus
Sylvain Soliman
Zoltan Somogyi
Harald Søndergaard
Fausto Spoto
Leon Sterling
Christopher A. Stone
Peter Stuckey
Péter Szeredi
Walid Taha
Vincent Tam
Héléne Touzet
Henk Vandecasteele
Wim Vanhoof
Femke van Raamsdonk
Sofie Verbaeten
German Vidal
David S. Warren
Markus Wenzel
Benjamin Werner
Roland Yap
Nobuko Yoshida
Zhang Yuanlin
Hans Zantema

Table of Contents