Lecture Notes in Computer Science 1258
Edited by G. Goos, J. Hartmanis and J. van Leeuwen

Advisory Board: W. Brauer D. Gries J. Stoer

Dirk van Dalen Marc Bezem (Eds.)

Computer Science Logic

10th International Workshop, CSL'96
Annual Conference of the EACSL
Utrecht, The Netherlands
September 21-27, 1996
Selected Papers

Springer

Series Editors

Gerhard Goos, Karlsruhe University, Germany

Juris Hartmanis, Cornell University, NY, USA

Jan van Leeuwen, Utrecht University, The Netherlands

Volume Editors

Dirk van Dalen
Marc Bezem
University of Utrecht, Department of Philosophy
P.O. Box 80.126, 3508 TC Utrecht, The Netherlands
E-mail: (dirk.vandalen/marc.bezem)@phil.ruu.nl

Cataloging-in-Publication data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

European Association for Computer Science Logic:
Annual Conference of the EACSL .... - Berlin ; Heidelberg ; New York ; Barcelona ; Budapest ; Hong Kong ; London ; Milan ; Paris ; Santa Clara ; Singapore ; Tokyo : Springer
1996. Computer science logic. - 1997
Computer science logic : 10th international workshop ; proceedings / CSL '96, Utrecht, The Netherlands, September 21 - 27, 1996. Dirk van Dalen ; Marc Bezem (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Budapest ; Hong Kong ; London ; Milan ; Paris ; Santa Clara ; Singapore ; Tokyo : Springer, 1997
(Annual Conference of the EACSL ... ; 1996) (Lecture notes in computer science ; Vol. 1258)
ISBN 3-540-63172-0

CR Subject Classification (1991): F.4, I.2.3-4, F.3

ISSN 0302-9743
ISBN 3-540-63172-0 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1997
Printed in Germany

Typesetting: Camera-ready by author
SPIN 10549810 06/3142 – 5 4 3 2 1 0 Printed on acid-free paper

Preface

The 1996 *Annual Conference of the European Association for Computer Science Logic, CSL'96*, was held at the University of Utrecht, The Netherlands, from September 21 – 27, 1996.

CSL'96 was the tenth in a series of workshops and the fifth to be held as the Annual Conference of the EACSL.

The scientific program included a tutorial program (September 21 – 22), invited lectures, and contributed papers (September 23 – 27). The tutorial program *Applications of Categorical Logic to Computer Science* was organized by I. Moerdijk, with tutorials by B. Jacobs, J. van Oosten, and G. Winskel; it focused in particular on applications to concurrency theory and was attended by 48 participants.

A total of 102 participants from 23 countries attended the conference. Invited lectures were given by P. Aczel, S. Artemov, R. Plasmeijer, J. Smith, C. Stirling, M. Vardi, D. Walker, and G. Winskel. The local organization was in the hands of M. Bezem.

The program committee selected 31 out of 75 submitted papers for the conference. From these 26 have been accepted, after the standard refereeing procedure, for publication in the present proceedings. Two invited speakers submitted a paper, that was likewise refereed and accepted. The selection was made by the program committee consisting of C. Beierle, J. Bergstra, D. van Dalen (chair), E. Grädel, G. Jäger, H.R. Jervell, M. Kanovitch, H. Kleine Büning, E. Moggi, A. Salwicki, U. Schöning, and W. Thomas.

We gratefully acknowledge the generous sponsorship by the following institutions:

- European Union (HCM Euroconferences Program)
- University of Utrecht (as part of the 72nd Lustrum Program)
- Koninklijke Nederlandse Akademie van Wetenschappen

The EU sponsorship enabled us to offer grants to young scientists from various countries in Europe.

We are grateful to the numerous referees for their work. Finally we thank Janneke Froon and Mark van Atten for their part in the organization of the conference.

April 1997 D. van Dalen, M. Bezem

Table of Contents

Four-Valued Diagnoses for Stratified Knowledge-Bases
O. Arieli, A. Avron 1

Fast Cut-Elimination by Projection
M. Baaz, A. Leitsch 18

On the Subject Reduction Property for Algebraic Type Systems
G. Barthe, P.-A. Melliès 34

Presheaf Models for Concurrency
G.L. Cattani, G. Winskel 58

Directed Virtual Reductions
V. Danos, M. Pedicini, L. Regnier 76

Bounded-Variable Fixpoint Queries are PSPACE-complete
S. Dziembowski 89

Graph Rewriting Semantics for Functional Programming Languages
M. van Eekelen, S. Smetsers, R. Plasmeijer 106

An Extension of Models of Axiomatic Domain Theory to Models of Synthetic Domain Theory
M.P. Fiore, G.D. Plotkin 129

Relative Undecidability in Term Rewriting
A. Geser, A. Middeldorp, E. Ohlebusch, H. Zantema 150

Extending Models of Second Order Predicate Logic to Models of Second Order Dependent Type Theory
H. Geuvers 167

Eta-Expansions in F^{ω}
N. Ghani 182

Cut-Free Display Calculi for Relation Algebras
R. Goré 198

Computational Aspects of Arity Hierarchies
H. Imhof 211

Weak Semantics Based on Lighted Button Pressing Experiments
A. Ingólfsdóttir 226

Kleene Algebra with Tests: Completeness and Decidability
D. Kozen, F. Smith 244

Monadic NP and Built-In Trees
M. Kreidler, D. Seese 260

Coercive Subtyping in Type Theory
Z. Luo 275

Proofs in System F_ω Can Be Done in System F_ω^1
S. Malecki 297

Optimization Problems with Approximation Schemes
A. Malmström 316

Computational Representations of Herbrand Models Using Grammars
R. Matzinger 334

Exact Pairs for Abstract Bounded Reducibilities
W. Merkle 349

The Logic of Explicitly Presentation-Invariant Circuits
M. Otto 369

Social Confluence in Client-Server Systems
A. Philippou, D. Walker 385

A Type-Free Resource-Aware λ-calculus
L. Roversi 399

Inductive Definitions with Decidable Atomic Formulas
A. Setzer 414

Call-by-value, Call-by-name and the Logic of Values
R.F. Stärk 431

On Cartesian Monoids
R. Statman 446

New Intuitionistic Logical Constants: Undecidability of the Conservativeness Problem
A.D. Yashin 460

Author Index 473