

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Zhong Shao (Ed.)

Programming Languages and Systems

5th Asian Symposium, APLAS 2007
Singapore, November 29-December 1, 2007
Proceedings

Volume Editor

Zhong Shao
Yale University
Department of Computer Science
51 Prospect Street
New Haven, CT 06520-8285, U.S.A.
E-mail: shao-zhong@cs.yale.edu

Library of Congress Control Number: 2007938893

CR Subject Classification (1998): D.3, D.2, F.3, D.4, D.1, F.4.1

LNCS Sublibrary: SL 2 – Programming and Software Engineering

ISSN	0302-9743
ISBN-10	3-540-76636-7 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-76636-0 Springer 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. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media

springer.com

© Springer-Verlag Berlin Heidelberg 2007
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12187423 06/3180 5 4 3 2 1 0

Preface

This volume contains the proceedings of the Fifth Asian Symposium on Programming Languages and Systems (APLAS 2007), which took place in Singapore, November 29 – December 1, 2007. The symposium was sponsored by the Asian Association for Foundation of Software (AAFS) and School of Computing, National University of Singapore.

In response to the call for papers, 84 full submissions were received. Each submission was reviewed by at least three Program Committee members with the help of external reviewers. The Program Committee meeting was conducted electronically over a 2-week period. After careful discussion, the Program Committee selected 25 papers. I would like to sincerely thank all the members of the APLAS 2007 Program Committee for their excellent job, and all the external reviewers for their invaluable contribution. The submission and review process was managed using the EasyChair system.

In addition to the 25 contributed papers, the symposium also featured three invited talks by Vincent Danos (University of Paris VII and CNRS, France), Sriram Rajamani (Microsoft Research India), and Vijay Saraswat (IBM T.J. Watson Research Lab, USA).

Many people helped to promote APLAS as a high-quality forum in Asia to serve programming language researchers worldwide. Following a series of well-attended workshops that were held in Singapore (2000), Daejeon (2001), and Shanghai (2002), the first four formal symposiums were held in Beijing (2003), Taipei (2004), Tsukuba (2005), and Sydney (2006).

I am grateful to the General Chair, Joxan Jaffar, for his invaluable support and guidance that made our symposium in Singapore possible and enjoyable. I am indebted to our Local Arrangements Chair, Wei-Ngan Chin, for his considerable effort to plan and organize the meeting itself. I thank Eijiro Sumii for serving as the Poster Chair and Alexandru Stefan for his help with the conference Web site and posters. Last but not least, I would like to thank the AAFS Chair Tetsuo Ida, and the program chairs of the past APLAS symposiums, especially Naoki Kobayashi, for their advice.

September 2007

Zhong Shao

Organization

General Chair

Joxan Jaffar (National University of Singapore, Singapore)

Program Chair

Zhong Shao (Yale University, USA)

Program Committee

Lars Birkedal (IT University of Copenhagen, Denmark)
Martin Hofmann (University of Munich, Germany)
Kohei Honda (Queen Mary, University of London, UK)
Atsushi Igarashi (Kyoto University, Japan)
Suresh Jagannathan (Purdue University, USA)
Annie Liu (State University of New York at Stony Brook, USA)
Shin-Cheng Mu (Academia Sinica, Taiwan)
Henrik Nilsson (University of Nottingham, UK)
Michael Norrish (NICTA, Australia)
Jens Palsberg (University of California, Los Angeles, USA)
G. Ramalingam (Microsoft Research, India)
Zhendong Su (University of California, Davis, USA)
Martin Sulzmann (National University of Singapore, Singapore)
Eijiro Sumii (Tohoku University, Japan)
Jérôme Vouillon (CNRS, France)
Kwangkeun Yi (Seoul National University, Korea)
Jian Zhang (Chinese Academy of Sciences, China)

Local Arrangements Chair

Wei-Ngan Chin (National University of Singapore, Singapore)

Poster Chair

Eijiro Sumii (Tohoku University, Japan)

External Referees

Andreas Abel	Alan Jeffrey	Tom Rothamel
Tomoyuki Aotani	Lingxiao Jiang	Abhik Roychoudhury
Kenichi Asai	Jan Johannsen	Alejandro Russo
Earl Barr	Yungbum Jung	Ondřej Rypáček
Josh Berdine	Deokhwan Kim	Andrei Sabelfeld
Lennart Beringer	Satoshi Kobayashi	Chieri Saito
Bodil Biering	Elliot Kolodner	Davide Sangiorgi
Maria Paola Bonacina	Soonho Kong	Ulrich Schoepp
Michele Boreale	Martin Lange	Xipeng Shen
Sugwoo Byun	Julia Lawall	Christian Stefansen
Pavol Cerny	Jimmy Lee	Scott Stoller
Supratik Chakraborty	Oukseh Lee	K. Tuncay Tekle
Yiyun Chen	Heejong Lee	Rene Thiemann
Troels Damgaard	Sorin Lerner	Alwen Tiu
Abhishek Das	Lei Liu	Seiji Umatani
Jeremy Dawson	Brian Logan	Tarmo Uustalu
Søren Debois	HW Loidl	Kapil Vaswani
Yuxin Deng	Lunjin Lu	Alexander Vaynberg
Daniel Dougherty	Wolfgang Lux	Maria Grazia Vigliotti
Gregory Duck	Roman Manevich	Mirko Viroli
Steven Eker	Mircea Marin	Walter Vogler
Hyunjun Eo	Aart Middeldorp	Razvan Voicu
Manuel Fahndrich	Matthew Might	David Walker
Xinyu Feng	Arjan Mooij	Liqiang Wang
Cedric Fournet	Mayur Naik	Meng Wang
Mark Gabel	Koji Nakazawa	Bow-Yaw Wang
Michael Gorbvitski	Hakjoo Oh	Gary Wassermann
Hermann Gruber	Luke Ong	Jun Wei
Sumit Gulwani	Sungwoo Park	Tao Wei
Ichiro Hasuo	Daejun Park	Ye Yang
Si-Min He	Benjamin Pierce	Hongseok Yang
Daniel Hirschhoff	Herbert Prähofer	Shoji Yuen
Haruo Hosoya	Murali K. Ramanathan	Gianluigi Zavattaro
Katia Hristova	Julian Rathke	Naijun Zhan
Barry Jay	Tamara Rezk	
Bertrand Jeannet	Andreas Rossberg	

Sponsoring Institutions

Asian Association for Foundation of Software (AAFS)
National University of Singapore

Table of Contents

Invited Talk 1

X10: Concurrent Programming for Modern Architectures (Abstract) <i>Vijay Saraswat</i>	1
--	---

Session 1

The Nuggetizer: Abstracting Away Higher-Orderness for Program Verification <i>Paritosh Shroff, Christian Skalka, and Scott F. Smith</i>	2
Local Reasoning for Storable Locks and Threads <i>Alexey Gotsman, Josh Berdine, Byron Cook, Noam Rinetzky, and Mooly Sagiv</i>	19
Monadic, Prompt Lazy Assertions in Haskell <i>Olaf Chitil and Frank Huch</i>	38

Session 2

Translation Correctness for First-Order Object-Oriented Pattern Matching <i>Burak Emir, Qin Ma, and Martin Odersky</i>	54
Persistent Oberon: A Programming Language with Integrated Persistence <i>Luc Bläser</i>	71
More Typed Assembly Languages for Confidentiality <i>Dachuan Yu</i>	86

Session 3

A Novel Test Case Generation Method for Prolog Programs Based on Call Patterns Semantics <i>Lingzhong Zhao, Tianlong Gu, Junyan Qian, and Guoyong Cai</i>	105
On a Tighter Integration of Functional and Logic Programming <i>Bernd Braßel and Frank Huch</i>	122

Invited Talk 2

Scalable Simulation of Cellular Signaling Networks <i>Vincent Danos, Jérôme Feret, Walter Fontana, and Jean Krivine</i>	139
--	-----

Session 4

Timed, Distributed, Probabilistic, Typed Processes	158
<i>Martin Berger and Nobuko Yoshida</i>	
A Probabilistic Applied Pi-Calculus	175
<i>Jean Goubault-Larrecq, Catuscia Palamidessi, and Angelo Troina</i>	
Type-Based Verification of Correspondence Assertions for Communication Protocols	191
<i>Daisuke Kikuchi and Naoki Kobayashi</i>	

Session 5

Deriving Compilers and Virtual Machines for a Multi-level Language . . .	206
<i>Atsushi Igarashi and Masashi Iwaki</i>	
Finally Tagless, Partially Evaluated: Tagless Staged Interpreters for Simpler Typed Languages	222
<i>Jacques Carette, Oleg Kiselyov, and Chung-chieh Shan</i>	
Polymorphic Delimited Continuations	239
<i>Kenichi Asai and Yukiyoishi Kameyama</i>	

Session 6

Adjunct Elimination in Context Logic for Trees	255
<i>Cristiano Calcagno, Thomas Dinsdale-Young, and Philippa Gardner</i>	
Positive Arithmetic Without Exchange Is a Subclassical Logic	271
<i>Stefano Berardi and Makoto Tatsuta</i>	
Mixed Inductive/Coinductive Types and Strong Normalization	286
<i>Andreas Abel</i>	

Invited Talk 3

Static and Dynamic Analysis: Better Together (Abstract)	302
<i>Sriram K. Rajamani</i>	

Session 7

The Semantics of “Semantic Patches” in Coccinelle: Program Transformation for the Working Programmer	303
<i>Neil D. Jones and René Rydhof Hansen</i>	

An Efficient SSA-Based Algorithm for Complete Global Value Numbering	319
<i>Jiu-Tao Nie and Xu Cheng</i>	

A Systematic Approach to Probabilistic Pointer Analysis	335
<i>Alessandra Di Pierro, Chris Hankin, and Herbert Wiklicky</i>	

Session 8

Complete Lattices and Up-To Techniques	351
<i>Damien Pous</i>	

A Trace Based Bisimulation for the Spi Calculus: An Extended Abstract	367
<i>Alwen Tiu</i>	

CCS with Replication in the Chomsky Hierarchy: The Expressive Power of Divergence	383
<i>Jesús Aranda, Cinzia Di Giusto, Mogens Nielsen, and Frank D. Valencia</i>	

Session 9

Call-by-Name and Call-by-Value in Normal Modal Logic	399
<i>Yoshihiko Kakutani</i>	

Call-by-Value Is Dual to Call-by-Name, Extended	415
<i>Daisuke Kimura</i>	

Author Index	431
---------------------------	-----