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Perspectives of System Informatics

8th International Ershov Informatics Conference, PSI 2011
Novosibirsk, Russia, June 27 - July 1, 2011
Revised Selected Papers

 Springer

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ISSN 0302-9743
ISBN 978-3-642-29708-3
DOI 10.1007/978-3-642-29709-0
Springer Heidelberg Dordrecht London New York

e-ISSN 1611-3349
e-ISBN 978-3-642-29709-0

Library of Congress Control Number: 2012935891

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

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

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Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

PSI is a forum for academic and industrial researchers, developers and users working on topics relating to computer, software and information sciences. The conference serves to bridge the gaps between different communities whose research areas are covered by but not limited to foundations of program and system development and analysis, programming methodology and software engineering, and information technologies. Another aim of the conference is improvement of contacts and exchange of ideas between researchers from the East and the West.

The previous seven PSI conferences were held in 1991, 1996, 1999, 2001, 2003, 2006 and 2009, and proved to be significant international events. Traditionally, PSI offers a program of tutorials, invited lectures, presentations of contributed papers and workshops complemented by a social program reflecting the amazing diversity of the culture and history of Novosibirsk.

The PSI 2011 conference was dedicated to the 80th anniversary of a pioneer in theoretical and system programming research, academician Andrei Petrovich Ershov (1931–1988) and to the 100th anniversary of one of the founders of cybernetics, a member of the Soviet Academy of Sciences Aleksei Andreevich Lyapunov (1911–1973).

Aleksei Lyapunov was one of the early pioneers of computer science in Russia. He worked at the Steklov Institute of Mathematics in Moscow and Institute of Applied Mathematics. In 1961 he moved to Novosibirsk where the Siberian Branch of the USSR Academy of Sciences had been founded. Initially, Aleksei Lyapunov worked at the Institute of Mathematics, then at the Institute of Hydrodynamics. He played an important role in the organization of the Physics and Mathematics School for talented children from all over Siberia, and was a professor at the Novosibirsk State University. In 1996 he posthumously received the IEEE Computer Society Computer Pioneer Award for his contribution to Soviet cybernetics and programming. There are many distinguished mathematicians among the students of Alexei Lyapunov, including Andrei Ershov.

Andrei Ershov graduated from Moscow State University in 1954. He began his scientific career under the guidance of professor Lyapunov, who was the supervisor of Andrei's PhD thesis. Andrei Ershov worked at the Institute of Precise Mechanics and Computing Machinery, and later headed the Theoretical Programming Department at the Computing Center of the USSR Academy of Sciences in Moscow. In 1958 the department was reorganized into the Institute of Mathematics of the Siberian Branch of the USSR Academy of Sciences, and by the initiative of the academician Sergei Sobolev Ershov was appointed the head of this department, which later became part of the Computing Center in Novosibirsk Akademgorodok. The first significant project of the department was aimed at developing the ALPHA system, an optimizing compiler for an extension of Algol 60 implemented on a Soviet computer M-20. Later the researchers of

the department created the Algibr, Epsilon, Sigma, and Alpha-6 programming systems for the BESM-6 computers. The list of achievements also includes the first Soviet time-sharing system AIST-0, the multi-language system BETA, research projects in artificial intelligence and parallel programming, integrated tools for text processing and publishing, and many more. Andrei Ershov was a leader and participant of these projects. In 1974 he was nominated as a Distinguished Fellow of the British Computer Society. In 1981 he received the Silver Core Award for his services to IFIP. Andrei Ershov's brilliant speeches were always the focus of public attention. Especially notable was his lecture on "Aesthetic and Human Factor in Programming" presented at the AFIPS Spring Joint Computer Conference in 1972.

This edition of the conference attracted 60 submissions from 26 countries. We wish to thank all their authors for their interest in PSI 2011. Each submission was reviewed by four experts, at least three of them from the same or closely related discipline as the authors. The reviewers generally provided high-quality assessment of the papers and often gave extensive comments to the authors for the possible improvement of the contributions. As a result, the Program Committee selected 18 high-quality papers as regular talks and 10 papers as short talks for presentation at the conference. A range of hot topics in computer science and informatics was covered by a tutorial and five invited talks given by prominent computer scientists from various countries.

We are glad to express our gratitude to all the persons and organizations who contributed to the conference: the authors of all the papers for their effort in producing the material included here; the sponsors for their moral, financial and organizational support; the Steering Committee members for their coordination of the conference; the Program Committee members and the reviewers who did their best to review and select the papers; and the members of the Organizing Committee for their contribution to the success of this event and its great cultural program. Finally, we would like to mention the fruitful cooperation with Springer during the preparation of this volume.

The Program Committee work was done using the EasyChair conference management system.

November 2011

Andrei Voronkov
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Table of Contents

Petri Net Distributability	1
<i>Eike Best and Philippe Darondeau</i>	
Connector Algebras, Petri Nets, and BIP	19
<i>Roberto Bruni, Hernán Melgratti, and Ugo Montanari</i>	
Models of Provenance (Abstract).....	39
<i>Peter Buneman</i>	
End-to-End Guarantees in Embedded Control Systems (Abstract).....	40
<i>Rupak Majumdar</i>	
Mining Precise Specifications (Abstract)	41
<i>Andreas Zeller</i>	
Detecting Entry Points in Java Libraries	42
<i>Thomas Baar and Philipp Kumar</i>	
Static Analysis of Run-Time Modes in Synchronous Process Network ...	55
<i>Michael Beyer and Sabine Glesner</i>	
Compositional Methods in Characterization of Timed Event Structures	68
<i>Elena Bozhenkova</i>	
Algorithmic Debugging of SQL Views	77
<i>Rafael Caballero, Yolanda García-Ruiz, and Fernando Sáenz-Pérez</i>	
Timed Transition Systems with Independence and Marked Scott Domains: An Adjunction.....	86
<i>Roman Dubtsov</i>	
An Extensible System for Enhancing Social Conference Experience	95
<i>Michael A.H. Fried, Anna Fensel, Federico Michele Facca, and Dieter Fensel</i>	
Exponential Acceleration of Model Checking for Perfect Recall Systems	111
<i>Natalia O. Garanina</i>	
Bootstrapping Compiler Generators from Partial Evaluators	125
<i>Robert Glück</i>	

A Logic Characteristic for Timed Extensions of Partial Order Based Equivalences	142
<i>Natalya S. Gribovskaya</i>	
Proving the Correctness of Unfold/Fold Program Transformations Using Bisimulation	153
<i>Geoff W. Hamilton and Neil D. Jones</i>	
Secure Multi-execution in Haskell	170
<i>Mauro Jaskelioff and Alejandro Russo</i>	
Towards an Open Framework for C Verification Tools Benchmarking . . .	179
<i>Alexey Khoroshilov, Vadim Mutilin, Eugene Novikov, Pavel Shved, and Alexander Strakh</i>	
Solving Coverability Problem for Monotonic Counter Systems by Supercompilation	193
<i>Andrei V. Klimov</i>	
Multi-result Supercompilation as Branching Growth of the Penultimate Level in Metasystem Transitions	210
<i>Ilya Klyuchnikov and Sergei A. Romanenko</i>	
Symbolic Loop Bound Computation for WCET Analysis	227
<i>Jens Knoop, Laura Kovács, and Jakob Zwirchmayr</i>	
GoRRiLA and Hard Reality	243
<i>Konstantin Korovin and Andrei Voronkov</i>	
Reachability in One-Dimensional Controlled Polynomial Dynamical Systems	251
<i>Margarita Korovina and Nicolai Vorobjov</i>	
Insertion Modeling System	262
<i>Alexander A. Letichevsky, Olexandr A. Letychevskiy, and Vladimir S. Peschanenko</i>	
Decidability of Modular Logics for Concurrency	274
<i>Radu Mardare</i>	
Partial Evaluation of Janus Part 2: Assertions and Procedures	289
<i>Torben Ægidius Mogensen</i>	
Scalable Parallel Interval Propagation for Sparse Constraint Satisfaction Problems	302
<i>Evgueni Petrov</i>	
A Combined Technique for Automatic Detection of Backward Binary Compatibility Problems	313
<i>Andrey Ponomarenko and Vladimir Rubanov</i>	

Weighted Lumpability on Markov Chains	322
<i>Arpit Sharma and Joost-Pieter Katoen</i>	
Development of the Computer Language Classification Knowledge Portal	340
<i>Nikolay V. Shilov, Alexander A. Akinin, Alexey V. Zubkov, and Renat I. Idrisov</i>	
Justified Terminological Reasoning	349
<i>Thomas Studer</i>	
Implementing Conflict Resolution	362
<i>Konstantin Korovin, Nestan Tsiskaridze, and Andrei Voronkov</i>	
Symbolic Tree Transducers	377
<i>Margus Veanes and Nikolaj Bjørner</i>	
Probabilistic Concepts in Formal Contexts	394
<i>Alexander Demin, Denis Ponomaryov, and Evgeny Vityaev</i>	
Author Index	411