# Invited Topics

A Type-Theoretic Memory Model for Verification of Sequential Java Programs ................................................ 1  
*Joachim van den Berg, Marieke Huisman, Bart Jacobs and Erik Poll*

From States to Histories ................................................... 22  
*Manfred Broy*

Principles and Pragmatics of Subtyping in PVS ......................... 37  
*Natarajan Shankar and Sam Owre*

# CASL: Language, Methodology and Tools

Extending Casl by Late Binding ........................................ 53  
*Davide Ancona, Maura Cerioli and Elena Zucca*

Towards an Evolutionary Formal Software-Development Using CASL ...... 73  
*Serge Autexier, Dieter Hutter, Heiko Mantel and Axel Schäfer*

Development of Parsing Tools for CASL Using Generic Language Technology ...................................................... 89  
*Mark G. J. van den Brand and Jeroen Scheerder*

Using CASL to Specify the Requirements and the Design:  
A Problem Specific Approach ............................................ 106  
*Christine Choppy and Gianna Reggio*

Subsorted Partial Higher-Order Logic as an Extension of CASL .......... 126  
*Till Mossakowski, Anne Haxthausen and Bernd Krieg-Brückner*

Specifying Real Numbers in CASL ....................................... 146  
*Markus Roggenbach, Lutz Schröder and Till Mossakowski*

# Foundations

Specification Refinement with System F – The Higher-Order Case .... 162  
*Jo Erskine Hannay*

Guarded Algebras: Disguising Partiality so You Won’t Know  
Whether Its There .......................................................... 182  
*Magne Haveraaen and Eric G. Wagner*

A General Completeness Result in Refinement .......................... 201  
*Yoshiki Kinoshita and John Power*
Table of Contents

An Institution of Hybrid Systems .................................................. 219
Hugo Lourenço and Amílcar Sernadas

Realization of Probabilistic Automata: Categorical Approach ............ 237
Paulo Mateus, Amílcar Sernadas and Cristina Sernadas

Specifications in an Arbitrary Institution with Symbols .................. 252
Till Mossakowski

A General Algebraic Framework for Studying Modular Systems .......... 271
Fernando Orejas and Eleiva Pino

Specification of Processes and Interactions

History Preserving Bisimulation for Contextual Nets ...................... 291
Paolo Baldan, Andrea Corradini and Ugo Montanari

A Model for Interaction of Agents and Environments ...................... 311
Alexander Letichevsky and David Gilbert

Algebra-Coalgebra Structures and Bialgebras ................................ 329
Ataru T. Nakagawa

A Uniform Model Theory for the Specification of Data
and Process Types ........................................................................ 348
Horst Reichel

Other Topics

Relating Abstract Datatypes and Z-Schemata .................................. 366
Hubert Baumeister

Algebraic Specification of Operator-Based Multimedia Scenarios ........ 383
Didier Bert and Stéphane Lo Presti

Higher-Order Logic and Theorem Proving for Structured Specifications ... 401
Tomasz Borzyszkowski

Extraction of Structured Programs from Specification Proofs ............ 419
John N. Crossley, Iman Poernomo and Martin Wirsing

Towards a Verification Logic for Rewriting Logic ........................... 438
José Luis Fiadeiro, Tom Maibaum, Narciso Marti-Oliet,
Jose Meseguer and Isabel Pita

The Rôle of Normalisation in Testing from Structured
Algebraic Specifications .................................................................. 459
Patricia D. L. Machado

Author Index ................................................................................. 477