

# Table of Contents

## Invited Talks

Composable Transactional Objects: A Position Paper . . . . .	1
<i>Maurice Herlihy and Eric Koskinen</i>	
Application-Scale Secure Multiparty Computation . . . . .	8
<i>John Launchbury, Dave Archer, Thomas DuBuisson, and Eric Mertens</i>	

## Type Systems

An Array-Oriented Language with Static Rank Polymorphism . . . . .	27
<i>Justin Slepak, Olin Shivers, and Panagiotis Manolios</i>	
Gradual Typing for Annotated Type Systems . . . . .	47
<i>Peter Thiemann and Luminous Fennell</i>	
Staged Composition Synthesis . . . . .	67
<i>Boris Döder, Moritz Martens, and Jakob Rehof</i>	
Overlapping and Order-Independent Patterns: Definitional Equality for All . . . . .	87
<i>Jesper Cockx, Frank Piessens, and Dominique Devriese</i>	

## Verified Compilation

Verified Compilation for Shared-Memory C . . . . .	107
<i>Lennart Beringer, Gordon Stewart, Robert Dockins, and Andrew W. Appel</i>	
Verifying an Open Compiler Using Multi-language Semantics . . . . .	128
<i>James T. Perconti and Amal Ahmed</i>	

## Program Verification I

Impredicative Concurrent Abstract Predicates . . . . .	149
<i>Kasper Svendsen and Lars Birkedal</i>	
Local Reasoning for the POSIX File System . . . . .	169
<i>Philippa Gardner, Gian Ntzik, and Adam Wright</i>	
A Coq Formalization of the Relational Data Model . . . . .	189
<i>Véronique Benzaken, Évelyne Contejean, and Stefania Dumbrava</i>	

## Semantics

On Probabilistic Applicative Bisimulation and Call-by-Value $\lambda$ -Calculi .....	209
<i>Raphaëlle Crubillé and Ugo Dal Lago</i>	
Grounding Synchronous Deterministic Concurrency in Sequential Programming .....	229
<i>Joaquín Aguado, Michael Mendler, Reinhard von Hanxleden, and Insa Fuhrmann</i>	
The Duality of Construction .....	249
<i>Paul Downen and Zena M. Ariola</i>	
Deriving Pretty-Big-Step Semantics from Small-Step Semantics .....	270
<i>Casper Bach Poulsen and Peter D. Mosses</i>	

## Concurrency

Communicating State Transition Systems for Fine-Grained Concurrent Resources .....	290
<i>Aleksandar Nanevski, Ruy Ley-Wild, Ilya Sergey, and Germán Andrés Delbianco</i>	
Checking Linearizability of Encapsulated Extended Operations .....	311
<i>Oren Zomer, Guy Golan-Gueta, G. Ramalingam, and Mooly Sagiv</i>	

## Linear Types

Bounded Linear Types in a Resource Semiring .....	331
<i>Dan R. Ghica and Alex I. Smith</i>	
A Core Quantitative Coeffect Calculus .....	351
<i>Aloïs Brunel, Marco Gaboardi, Damiano Mazza, and Steve Zdancewic</i>	
Measurements in Proof Nets as Higher-Order Quantum Circuits .....	371
<i>Akira Yoshimizu, Ichiro Hasuo, Claudia Faggian, and Ugo Dal Lago</i>	

## Program Verification II

Automatic Termination Verification for Higher-Order Functional Programs .....	392
<i>Takuya Kuwahara, Tachio Terauchi, Hiroshi Unno, and Naoki Kobayashi</i>	
An Abstract Domain to Infer Ordinal-Valued Ranking Functions .....	412
<i>Caterina Urban and Antoine Miné</i>	

Model and Proof Generation for Heap-Manipulating Programs . . . . .	432
<i>Martin Brain, Cristina David, Daniel Kroening, and Peter Schrammel</i>	
REAP: Reporting Errors Using Alternative Paths . . . . .	453
<i>João Matos, João Garcia, and Paolo Romano</i>	
<b>Network and Process Calculi</b>	
The Network as a Language Construct . . . . .	473
<i>Tony Garnock-Jones, Sam Tobin-Hochstadt, and Matthias Felleisen</i>	
Resolving Non-determinism in Choreographies . . . . .	493
<i>Laura Bocchi, Hernán Melgratti, and Emilio Tuosto</i>	
<b>Program Analysis</b>	
A Correspondence between Two Approaches to Interprocedural Analysis in the Presence of Join . . . . .	513
<i>Ravi Mangal, Mayur Naik, and Hongseok Yang</i>	
Targeted Update – Aggressive Memory Abstraction Beyond Common Sense and Its Application on Static Numeric Analysis . . . . .	534
<i>Zhoulai Fu</i>	
Affine Parallelization of Loops with Run-Time Dependent Bounds from Binaries . . . . .	554
<i>Aparna Kotha, Kapil Anand, Timothy Creech, Khaled ElWazeer, Matthew Smithson, and Rajeev Barua</i>	
<b>Author Index</b> . . . . .	575