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Monday April 16
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08:30-09:00 Opening

09:00-10:00 Invited Speaker: Benjamin Pierce

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10:30-12:30

PO-1: Information Flow and Non-Intereference

Ian Sweet, Jose Calderon, Chad Scherrer, Michael Hicks and Stephen Magill.
What's the Over/Under? Probabilistic Bounds on Information Leakage

Panagiotis Vasilikos, Flemming Nielson and Hanne Riis Nielson.
Secure Information Release in Timed Automata

Aleksandr Karbyshev, Kasper Svendsen, Aslan Askarov and Lars Birkedal.
Compositional Non-Interference for Concurrent Programs via Separation and Framing

Arthur Azevedo de Amorim, Catalin Hritcu and Benjamin Pierce.
The Meaning of Memory Safety

FO-1: Semantics

Simon Castellan, Pierre Clairambault, Jonathan Hayman and Glynn Winskel. Non-angelic concurrent game semantics

Guilhem Jaber and Nikos Tzevelekos. A Trace Semantics for System F Parametric Polymorphism

Clément Jacq and Paul-André Melliès. Categorical combinatorics for non deterministic strategies on simple games

Marco Devesas Campos and Paul Levy. A Syntactic View of Computational Adequacy

ES-1: Language Design

Consistent Subtyping for All
Authors: Ningning Xie, Xuan Bi, Bruno C. d. S. Oliveira (The University of Hong Kong)

HOBiT: Programming Lenses without using Lens Combinators
Authors: Kazutaka Matsuda (Tohoku University); Meng Wang (University of Kent)

Dualizing Generalized Algebraic Data Types by Matrix Transposition
Authors: Klaus Ostermann, Julian Jabs (University of Tuebingen)

Deterministic Concurrency: A Clock-Synchronised Shared Memory Approach
Authors: Joaquin Aguado, Michael Mendler (University of Bamberg); Marc Pouzet (École Normale Supérieure (ENS)); Partha Roop (University of Auckland); Reinhard von Hanxleden (University of Kiel)

TA-1: Theorem Proving

Giles Reger, Martin Suda and Andrei Voronkov
Unification with Abstraction and Theory Instantiation in Saturation-based Reasoning
Bohua Zhan
Efficient verification of imperative programs using auto2
Quang Loc Le, Jun Sun and Shengchao Qin
Frame Inference for Inductive Entailment Proofs in Separation Logic

Simon Wimmer and Peter Lammich
Verified Model Checking of Timed Automata

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14:00-16:00

PO-2: Leakage, Information Flow, and Protocols

Hamed Nemati, Roberto Guanciale, Christoph Baumann and Mads Dam.
Formal Verification of Integrity Preserving Countermeasures against Cache Storage

Mario S. Alvim, Konstantinos Chatzikokolakis, Yusuke Kawamoto and Catuscia Palamidessi.
Leakage and protocol composition in a game-theoretic perspective

Véronique Cortier, Niklas Grimm, Joseph Lallemand and Matteo Maffei.
Equivalence properties by typing in cryptographic branching protocols

Giada Sciarretta, Roberto Carbone, Silvio Ranise and Luca Viganò.
Design, Formal Specification and Analysis of Multi-Factor Authentication Solutions with a Single Sign-On Experience

FO-2: Linearity

Ornela Dardha and Simon Gay.
A New Linear Logic for Deadlock-Free Session-Typed Processes

Shin-Ya Katsumata.
A Double-Category Theoretic Analysis of Graded Linear Exponential Comonads

Bernardo Toninho and Nobuko Yoshida.
Depending on Session-Typed Processes

Gabriel Scherer, Max New, Nicholas Rioux and Amal Ahmed.
FabULous Interoperability for ML and a Linear Language

ES-2: Probabilistic Programming

A Program Logic for Probabilistic Programs
Authors: Gilles Barthe (IMDEA Software Institute); Thomas Espitau (Université Pierre et Marie Curie); Marco Gaboardi (University at Buffalo, SUNY); Benjamin Grégoire (Inria); Justin Hsu (University College London); Pierre-Yves Strub (École Polytechnique)

Fine-grained Semantics for Probabilistic Programs
Authors: Benjamin Bichsel, Timon Gehr, Martin Vechev (ETH Zürich)

How long, O Bayesian network, will I sample thee?
Authors: Kevin Batz, Benjamin Lucien Kaminski, Joost-Pieter Katoen, Christoph Matheja (RWTH Aachen University)

Relational Reasoning for Markov Chains in a Probabilistic Guarded Lambda Calculus
Authors: Alejandro Aguirre, Gilles Barthe (IMDEA Software Institute); Lars Birkedal, Aleš Bizjak (Aarhus University); Marco Gaboardi (University at Buffalo, SUNY); Deepak Garg (MPI-SWS)

TA-2: SAT & SMT I

Randal Bryant
Chain Reduction for Binary and Zero-Suppressed Decision Diagrams
Hakan Metin, Souheib Baarir, Maximilien Colange and Fabrice Kordon
CDCLSym: Introducing Effective Symmetry Breaking in SAT Solving
Kshitij Bansal, Eric Koskinen and Omer Tripp
Automatic Generation of Precise and Useful Commutativity Conditions

Seonmo Kim and Stephen McCamant
Bit-Vector Model Counting using Statistical Estimation

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16:30-18:00

Tutorial: Fabio Somenzi

TA-3: Deductive Verification

Maximilian Paul Louis Haslbeck and Tobias Nipkow
Hoare Logics for Time Bounds

Raphaël Cauderlier and Mihaela Sighireanu
A Verified Implementation of the Bounded List Container
Alexander J. Summers and Peter Müller
Automating Deductive Verification for Weak-Memory Programs

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Tuesday April 17
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09:00-10:00 Invited Speaker: Martin Abadi

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10:30-12:30

PO-3: Smart Contracts and Privacy

Nicola Atzei, Massimo Bartoletti, Tiziana Cimoli, Stefano Lande and Roberto Zunino.
SoK: unraveling Bitcoin smart contracts

Ilya Grishchenko, Matteo Maffei and Clara Schneidewind.
A Semantic Framework for the Security Analysis of Ethereum smart contracts

Anastasia Mavridou and Aron Laszka.
Tool Demonstration: FSolidM for Designing Secure Ethereum Smart Contracts

Reinhard Munz, Fabienne Eigner, Matteo Maffei, Paul Francis and Deepak Garg.

UniTraX: Protecting Data Privacy with Discoverable Biases

FO-3: Concurrency

Paolo Baldan and Tommaso Padoan.
Automata for True Concurrency Properties

Rob van Glabbeek.
A Theory of Encodings and Expressiveness

Luca Aceto, Antonis Achilleos, Adrian Francalanza and Anna Ingolfsdottir.
A Framework for Parameterized Monitorability

Xinxin Liu, Tingting Yu and Wenhui Zhang.
Logics for Bisimulation and Divergence

ES-3: Types and Effects

Failure is Not an Option: An Exceptional Type Theory
Authors: Pierre-Marie Pédrot (Max Planck Institute); nicolas tabareau (Inria Nantes, France)

Let Arguments Go First
Authors: Ningning Xie, Bruno C. d. S. Oliveira (The University of Hong Kong)

Behavioural equivalence via modalities for algebraic effects
Authors: Alex Simpson, Niels Voorneveld (University of Ljubljana)

Explicit Effect Subtyping
Authors: Amr Hany Saleh, Georgios Karachalias (KU Leuven); Matija Pretnar (University of Ljubljana); Tom Schrijvers (KU Leuven)

TA-4: Software Verification and Optimisation

Shrawan Kumar, Amitabha Sanyal, Venkatesh R and Punit Shah
Property Checking Array Programs Using Loop Shrinking
Daniel Neider, P. Madhusudan, Pranav Garg, Shambwaditya Saha and Daejun Park
Invariant Synthesis for Incomplete Verification Engines
Grigory Fedyukovich and Rastislav Bodik
Accelerating Syntax-Guided Invariant Synthesis

Eva Darulova, Anastasiia Izycheva, Fariha Nasir, Fabian Ritter, Heiko Becker and Robert Bastian
Daisy - Framework for Analysis and Optimization of Numerical Programs (Tool Paper)

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14:00-16:00

PO-4: Firewalls and Attack-Defense Trees

Chiara Bodei, Pierpaolo Degano, Riccardo Focardi, Letterio Galletta and Mauro Tempesta.
Transcompiling Firewalls

Barbara Kordy and Wojciech Widel.
On quantitative analysis of attack-defense trees with repeated labels

FO-4: Lambda Calculus and Types

Delia Kesner, Alejandro Rios and Andres Viso.
Call-by-need, neededness and all that

Ranald Clouston.
Fitch-Style Modal Lambda Calculi

Étienne Miquey and Hugo Herbelin.
Realizability interpretation and normalization of typed call-by-need λ-calculus with control

Thorsten Altenkirch, Paolo Capriotti, Gabe Dijkstra, Nicolai Kraus and Fredrik Nordvall Forsberg.
Quotient Inductive-Inductive Types

ES-4: Concurrency

A separation logic for a promising semantics
Authors: Kasper Svendsen, Jean Pichon-Pharabod (University of Cambridge); Marko Doko (MPI-SWS); Ori Lahav (Tel Aviv University); Viktor Vafeiadis (MPI-SWS)

Logical Reasoning over Disjoint Permissions
Authors: Xuan Bach Le, Aquinas Hobor (National University of Singapore)

Deadlock-Free Condition Variables
Authors: Jafar Hamin, Bart Jacobs (imec-distrinet, Dept. C.S., KU Leuven)

Fragment Abstraction for Concurrent Shape Analysis
Authors: Parosh Aziz Abdulla, Bengt Jonsson, Cong Quy Trinh (Uppsala University)

TA-5: Model Checking

Tom van Dijk
Oink: an Implementation and Evaluation of Modern Parity Game Solvers

Rohit Dureja and Kristin Yvonne Rozier
More Scalable LTL Model Checking via Discovering Design-Space Dependencies

Chuan Jiang and Gianfranco Ciardo
Generation of Minimum Tree-like Witnesses for Existential CTL

Gabriele Costa, David Basin, Chiara Bodei, Pierpaolo Degano and Letterio Galletta
From Natural Projection to Partial Model Checking and Back

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16:30-18:00

FO-5: Category Theory and Quantum Control

Sergey Goncharov and Lutz Schröder.
Guarded Traced Symmetric Monoidal Categories

Ana Sokolova and Harald Woracek.
Proper Semirings and Proper Convex Functors

Amr Sabry, Juliana Vizzotto and Benoît Valiron.

From Symmetric Pattern-Matching to Quantum Control

ES-5: Security

Reasoning About a Capability Machine with Local Capabilities - Provably Safe Stack and Return Pointer Management (without OS Support)
Authors: Lau Skorstengaard (Aarhus University); Dominique Devriese (imec-DistriNet, KU Leuven); Lars Birkedal (Aarhus University)

Modular Product Programs
Authors: Marco Eilers, Peter Müller, Samuel Hitz (ETH Zurich)

TA-6: Machine Learning

Adrien Champion, Tomoya Chiba, Naoki Kobayashi and Ryosuke Sato
ICE-based Refinement Type Discovery for Higher-Order Functional Programs
Tomas Brazdil, Krishnendu Chatterjee, Jan Kretinsky and Viktor Toman
Strategy Representation by Decision Trees in Reactive Synthesis
Matthew Wicker, Xiaowei Huang and Marta Kwiatkowska
Feature-Guided Black-Box Safety Testing of Deep Neural Networks

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Wednesday April 18
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09:00-10:00 Invited Speaker: Pamela Zave

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10:30-12:30

FA-1: Model-Based Software Development

Gabriele Taentzer, Timo Kehrer, Christopher Pietsch and Udo Kelter
A Formal Framework for Incremental Model Slicing

Zinovy Diskin, Harald König and Mark Lawford
Multiple Model Synchronization with Multiary Delta Lenses
Sebastian Ruland, Géza Kulcsár, Erhan Leblebici, Sven Peldszus and Malte Lochau
Controlling the Attack Surface of Object-Oriented Refactorings

Rajesh Kumar, Stefano Schivo, Enno Ruijters, Bugra Mehmet Yildiz, David Huistra, Jacco Brandt, Arend Rensink and Mariëlle Stoelinga
Efficient Analysis of Attack Trees: a Model-Driven Approach

FO-6: Quantitative Models

Stéphane Le Roux and Guillermo Pérez.
The Complexity of Graph-Based Reductions for Reachability in Markov Decision Processes

Pedro R. D'Argenio, Marcus Gerhold, Arnd Hartmanns and Sean Sedwards.
A Hierarchy of Scheduler Classes for Stochastic Automata

Hugo Bazille, Eric Fabre and Blaise Genest.
Symbolically Quantifying Response Time in Stochastic Models using Moments and Semirings

Suguman Bansal, Swarat Chaudhuri and Moshe Vardi.
Comparator Automata in Quantitative Verification

ES-6: Program Verification

A Fistful of Dollars: Formalizing Asymptotic Complexity Claims via Deductive Program Verification
Authors: Armaël Guéneau (Inria Paris); Arthur Charguéraud (Inria); François Pottier (Inria Paris)

Verified Learning Without Regret
Authors: Samuel Merten, Alexander Bagnall, Gordon Stewart (Ohio University)

Program Verification by Coinduction
Authors: Brandon Moore (Runtime Verification, Inc.); Lucas Peña, Grigore Rosu (University of Illinois at Urbana-Champaign)

Belisarius: Byzantine Fault Tolerant Protocols Powered by Coq
Authors: Vincent Rahli, Ivana Vukotic, Marcus Volp, Paulo Verissimo (SnT, University of Luxembourg)

TA-7: Concurrent and Distributed Systems

Philipp J. Meyer, Javier Esparza and Hagen Völzer
Computing the concurrency threshold of sound free-choice workflow nets

Peter Chini, Roland Meyer and Prakash Saivasan
Fine-Grained Complexity of Safety Verification

Balasubramanian A.R., Nathalie Bertrand and Nicolas Markey
Parameterized verification of synchronization in constrained reconfigurable broadcast networks

Cristian Mattarei, Clark Barrett, Shu-Yu Guo, Bradley Nelson and Ben Smith
EMME: a formal tool for the ECMAScript Memory Model Evaluation

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14:00-16:00

FA-2: Distributed Program and System Analysis
Si Liu, Peter Ölveczky, Keshav Santhanam, Qi Wang, Indranil Gupta and Jose Meseguer
ROLA: A New Distributed Transaction Protocol and Its Formal Analysis

Panagiotis Katsaros, Peter Poplavko, Fotios Gioulekas, Saddek Bensalem and Pedro Palom
A Process Network Model for Reactive Streaming Software with Deterministic Task Parallelism

Márton Búr, Gábor Szilágyi, András Vörös and Daniel Varro
Distributed Graph Queries for Runtime Monitoring of Cyber-Physical Systems

Joonyoung Park, Kwangwon Sun and Sukyoung Ryu
EventHandler-based Analysis Framework for Web Apps using Dynamically Collected States

FO-7: Logics and Equational Theories

Simon Docherty and David Pym.
Modular Tableaux Calculi for Separation Theories

Abbas Edalat and Mehrdad Maleki.
Differential Calculus with Imprecise Input and its Logical Framework

Stéphane Demri, Étienne Lozes and Alessio Mansutti.
The Effects of Adding Reachability Predicates in Propositional Separation Logic

Luigi Santocanale.
The equational theory of the natural join and of inner union is decidable

ES-7: Program Analysis and Automated Verification

Evaluating Design Tradeoffs in Numeric Static Analysis for Java
Authors: Shiyi Wei (The University of Texas at Dallas); Piotr Mardziel (Carnegie Mellon University); Andrew Ruef, Jeffrey S. Foster, Michael Hicks (University of Maryland, College Park)

An Abstract Interpretation Framework for Input Data Usage
Authors: Caterina Urban, Peter Müller (ETH Zurich, Switzerland)

Higher-Order Program Verification via HFL Model Checking
Authors: Naoki Kobayashi, Takeshi Tsukada, Keiichi Watanabe (The University of Tokyo)

Quantitative Analysis of Smart Contracts
Authors: Krishnendu Chatterjee, Amir Kafshdar Goharshady (IST Austria); Yaron Velner (Hebrew University of Jerusalem)

TA-8: SAT & SMT II

Marijn Heule and Armin Biere
What a Difference a Variable Makes

Radu Iosif and Xiao Xu
Abstraction Refinement for Emptiness Checking of Alternating Data Automata

Andrew Reynolds, Haniel Barbosa and Pascal Fontaine
Revisiting Enumerative Instantiation

Pierre Roux, Mohamed Iguernlala and Sylvain Conchon
An Non-linear Arithmetic Procedure for Control-Command Software Verification.

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16:30-18:00

Tutorial: Armin Biere

TA-9: Security & Reactive Systems

Milan Ceska, Vojtech Havlena, Lukas Holik, Ondrej Lengal and Tomas Vojnar
Approximate Reduction of Finite Automata for High-Speed Network Intrusion Detection

Andreas Katis, Grigory Fedyukovich, Huajun Guo, Andrew Gacek, John Backes, Arie Gurfinkel and Michael Whalen
Validity-Guided Synthesis of Reactive Systems from Assume-Guarantee Contract

Bernd Finkbeiner, Christopher Hahn, Marvin Stenger and Leander Tentrup
RVHyper: A Runtime Verification Tool for Temporal Hyperproperties (tool

demo)

Iulia Dragomir, Viorel Preoteasa and Stavros Tripakis
The Refinement Calculus of Reactive Systems Toolset (tool demo)
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Thursday April 19
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09:00-10:00 Invited Speaker: Derek Dreyer

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10:30-12:30

FA-3: Software Design and Verification

Diego Marmsoler
Hierarchical Specification and Verification of Architecture Design Patterns

Claudio Menghi, Paola Spoletini, Marsha Chechik and Carlo Ghezzi
Supporting Verification-Driven Incremental Distributed Design of Components

Nikolaos Katirtzis, Themistoklis Diamantopoulos and Charles Sutton
Summarizing Software API Usage Examples using Clustering Techniques

Jean-Christophe Léchenet, Nikolai Kosmatov and Pascale Le Gall
Fast Computation of Arbitrary Control Dependencies

FO-8: Graphs and Automata

Guillaume Rabusseau.
Minimization of Graph Weighted Models over Circular Strings

Patricia Bouyer.
Games on graphs with a public signal monitoring

Sławomir Lasota and Radosław Piórkowski.
WQO Dichotomy for 3-graphs

Thomas Genet, Timothée Haudebourg and Thomas Jensen.
Verifying Higher-Order Functions with Tree Automata

ES-8: Session Types and Concurrency

Session-Typed Concurrent Contracts
Authors: Hannah Gommerstadt, Limin Jia, Frank Pfenning (Carnegie Mellon University)

A Typing Discipline for Statically Verified Crash Failure Handling in Distributed Systems
Authors: Malte Viering, Tzu-Chun Chen (TU Darmstadt, Germany); Patrick Eugster (TU Darmstadt, Germany; Università della Svizzera italiana, Switzerland; Purdue University, USA); Raymond Hu (Imperial College London, UK); Lukasz Ziarek (SUNY Buffalo, USA)

On Polymorphic Sessions and Functions: A Tale of Two (Fully Abstract) Encodings
Authors: Bernardo Toninho, Nobuko Yoshida (Imperial College London)

Concurrent Kleene Algebra: Free Model and Completeness

Authors: Tobias Kappé, Paul Brunet, Alexandra Silva, Fabio Zanasi (University College London)

TA-10: Static and Dynamic Program Analysis

Lina Marsso, Radu Mateescu and Wendelin Serwe
TESTOR: A Modular Tool for On-the-Fly Conformance Test Case Generation

Stavros Aronis, Bengt Jonsson, Magnus Lång and Konstantinos Sagonas
Optimal Dynamic Partial Order Reduction with Observers
Elena Sherman and Matthew Dwyer
Structurally Defined Conditional Data-flow Static Analysis
Jan Leike and Matthias Heizmann
Geometric Nontermination Arguments

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14:00-16:00

FA-4: Specification and Program Testing

Oszkár Semeráth and Daniel Varro
Iterative Generation of Diverse Models for Testing Specifications of DSL Tools

David Landsberg, Youcheng Sun and Daniel Kroening
Optimising Spectrum Based Fault Localisation for Single Fault Programs using Specifications

Yavuz Koroglu and Alper Sen
TCM: Test Case Mutation to Improve Crash Detection in Android

Bo Chen, Christopher Havlicek, Zhenkun Yang, Kai Cong, Raghudeep Kannavara and Fei Xi
CRETE: A Versatile Binary-Level Concolic Testing Framework

ES-9: Concurrency and Distribution

Correctness of a fully concurrent Garbage Collector for Actor Languages
Authors: Juliana Vicente Franco (Imperial College London); Sylvan Clebsch (Microsoft Research, Cambridge); Sophia Drossopoulou (Imperial College London); Jan Vitek (Northeastern University, Boston & CVUT, Prague); Tobias Wrigstad (Uppsala University, Uppsala)

Paxos Consensus, Deconstructed and Abstracted
Authors: Álvaro García-Pérez, Alexey Gotsman, Yuri Meshman (IMDEA Software Institute); Ilya Sergey (University College London)

On Parallel Snapshot Isolation and Release/Acquire Consistency
Authors: Azalea Raad (MPI-SWS); Ori Lahav (Tel Aviv University); Viktor Vafeiadis (MPI-SWS)

Eventual Consistency for CRDTs
Authors: Radha Jagadeesan, James Riely (DePaul University)

TA-11: Hybrid and Stochastic Systems

Stefan Schupp and Erika Abraham
Efficient dynamic error reduction for hybrid systems reachability analysis
Dejan Nickovic, Olivier Lebeltel, Oded Maler, Thomas Ferrère and Dogan

Ulus
AMT2.0: Qualitative and Quantitative Trace Analysis with Extended Signal Temporal Logic

Arnd Hartmanns, Sebastian Junges, Joost-Pieter Katoen and Tim Quatmann
Multi-Cost Bounded Reachability in MDPs

Carlos E. Budde, Pedro R. D'Argenio, Arnd Hartmanns and Sean Sedwards
A Statistical Model Checker for Nondeterminism and Rare Events
TA-SWC:

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16:30-18:00

FA-5: Family-Based Software Development

Aleksandar S. Dimovski
Abstract Family-based Model Checking using Modal Featured Transition Systems: Preservation of CTL*

Marsha Chechik, Ioanna Stavropoulou, Cynthia Disenfeld and Julia Rubin
FPH: Efficient Non-Commutativity Analysis of Feature-Based Systems

Daniel Strüber, Sven Peldszus and Jan Jürjens
Taming Multi-Variability of Software Product Line Transformations

ES-10: Compiler Verification

A Verified Compiler from Isabelle/HOL to CakeML
Authors: Lars Hupel, Tobias Nipkow (Technische Universität München)

Compositional Verification of Compiler Optimisations on Relaxed Memory
Authors: Mike Dodds (Galois Inc.); Mark Batty (University of Kent); Alexey Gotsman (IMDEA Software Institute)

TA-12: Temporal Logic and Mu-Calculus

Daniel Hausmann, Lutz Schröder and Hans-Peter Deifel
Permutation Games for the Weakly Aconjunctive mu-Calculus
Kedar Namjoshi and Richard Trefler
Symmetry Reduction for the Local Mu-Calculus

Luca Bortolussi and Simone Silvetti
Bayesian Statistical Parameter Synthesis for Linear Temporal Properties of Stochastic Models