

# HIGHLIGHTS 2019

## OF LOGIC, GAMES AND AUTOMATA

CONFERENCE PROGRAMME

Warsaw, 17-20 September 2019

### TUESDAY (Tutorial Day)

- 9:00–9:30 Registration
- 9:30–10:45 **Tutorial 1**  
Sebastian Siebertz: Nowhere dense graph classes and algorithmic applications  
Session chair: Nicole Schweikardt
- 10:45–11:15 Coffee Break
- 11:15–12:15 **Tutorial 1 cont.**
- 12:15–14:15 Lunch Break
- 14:15–15:30 **Tutorial 2:**  
Guy Avni, Formal Methods Meets Algorithmic Game Theory  
Session chair: Damian Niwiński
- 15:30–16:00 Coffee Break
- 16:00–17:00 **Tutorial 2 cont.**

### WEDNESDAY

- 9:00–9:30 Registration
- 9:30–10:30 **Invited Talk**  
Dmitry Chistikov, On the complexity of logics over the integers
- 10:30–11:00 Coffee Break
- 11:00–12:20 **Session 1: LOGICS**
- 12:20–14:20 Lunch Break
- Session 2A: POPULATION PROTOCOLS AND PROBABILISTIC SYSTEMS**  
**Session 2B: PROGRAM VERIFICATION AND TREE AUTOMATA**
- 14:20–15:30 Coffee Break
- 15:30–16:00 Coffee Break
- 16:00–17:20 **Session 3: TRANSDUCERS**
- 17:20–17:35 Short Break
- 17:35–18:25 **Session 4: PARITY GAMES AND GAMES WITH FINITE MEMORY**

### THURSDAY

- 8:45–9:00 Registration
- 9:00–11:00 **Spotlight Session**  
Jérôme Leroux: Reachability in Vector Addition Systems is Not Elementary  
Sylvain Schmitz: Reachability in Vector Addition Systems is Primitive-Recursive in Fixed Dimension
- 11:00–11:30 Coffee Break
- 11:30–12:20 **Session 5: VECTOR ADDITION SYSTEMS**
- 12:20–14:20 Lunch Break
- 14:20–15:40 **Session 6: MIXED TOPICS**
- 15:40–16:10 Coffee Break
- Session 7A: BRACKETS, PETRI NETS, AND TIMED AUTOMATA**  
**Session 7B: MARKOV PROCESSES AND STOCHASTIC HYBRID SYSTEMS**
- 16:10–17:10 Short Break
- 17:10–17:20 Short Break
- 17:20–18:20 **Session 8: AUTOMATA ON WORDS**
- 19:00 Picnic

### FRIDAY

- 9:00–10:00 **Invited Talk**  
Marie Fortin: Expressivity of first-order logic and star-free propositional dynamic logic over ordered structures
- 10:00–10:30 Coffee Break
- 10:30–11:50 **Session 9: REGULARITY**
- 11:50–12:00 Short Break
- 12:00–13:00 **Session 10: MEAN-PAYOFF GAMES, REACHABILITY GAMES, AND PATROLLING GAMES**
- 13:00–13:10 Closing Remarks

## WEDNESDAY, 18.09

### 9:30–10:30 Invited talk

Dmitry Chistikov: On the complexity of logics over the integers  
Session chair: Michael Benedikt

### 11:00–12:20 Session 1: LOGICS

Session chair: Dmitry Chistikov

Laureline Pinault	Undecidability of MSO with Path-Measure Quantifier via Probabilistic Automata
Szymon Toruńczyk	Aggregation, Enumeration, and Updates on Sparse Databases via Circuits
Stanislav Kikot	On Monotone Determinacy of Recursive Queries over Disjunctive Views
Steffen van Bergerem	Learning Concepts Definable in First-Order Logic with Counting
Gabriel Istrate	Proof complexity of Kneser-Lovasz formulas and other combinatorial principles: the role of kernelization
Benjamin Lucien Kaminski	Quantitative Separation Logic - A Logic for Reasoning about Probabilistic Pointer Programs
Eugenia Ternovska	A Logic of Information Flows
Arthur Milchior	MightyL: From Metric Interval Temporal Logic to Timed/Signal automata

### 14:20–15:30 Session 2a: POPULATION PROTOCOLS AND PROBABILISTIC SYSTEMS

Session chair: Mickael Randour

Stefan Jaax	Succinct Population Protocols
Chana Weil-Kennedy	The Complexity of Verifying Observation Population Protocols
Antonin Kucera	Termination complexity of Parameterized Population Protocols
Catalin Dima	Model Checking Strategic Abilities in Information-sharing Agents
Jan Kretinsky	Semi-Quantitative Abstraction and Analysis of Stochastic Population Models
Edoardo Pirovano	A Counter Abstraction Technique for the Verification of Probabilistic Swarm Systems
Julia Eisentraut	Stopping Criteria for Value and Strategy Iteration on Concurrent Stochastic Games

### 14:20–15:30 Session 2b: PROGRAM VERIFICATION AND TREE AUTOMATA

Session Chair: Marie Fortin

Pierre Clairambault	<u>On the expressivity of linear recursion schemes</u>
Peter Chini	Parameterized Complexity of Program Verification Tasks
Mehran Hosseini	Termination of Affine Loops over the Integers
Paul Brunet	Pomsets with boxes: towards Atomic CKA
Patrick Landwehr	Tree Automata with Global Constraints for Infinite Trees
David Barozzini	<u>Cost Logics, Safe Schemes, and Downward Closures</u>
Alexander Rabinovich	Degrees of Ambiguity of Büchi Tree Automata

### 16:00–17:20 Session 3: TRANSDUCERS

Session Chair: Thomas Colcombet

Mikolaj Bojanczyk	Polyregular functions
Sandra Kiefer	String-to-String Interpretations with Polynomial-Size Output
Sougata Bose	Origin-equivalence and resynchronizers for two-way transducers
Jan Martens	Resynchronizability of one-way transducers is undecidable
Anca Muscholl	Equivalence of finite-valued streaming string transducers is decidable
Janusz Schmude	Deciding Transducer Equivalence via Simulating an Algebra With a Ring of Polynomials
Amina Doumane	First-order tree-to-tree functions
Adrien Boiret	Deciding equivalence on symbolic DTop with lookahead

### 17:35–18:25 Session 4: PARITY GAMES AND GAMES WITH FINITE MEMORY

Session Chair: Marcin Jurdziński

Mickael Randour	Games Where You Can Play Optimally With Finite Memory
Karoliina Lehtinen	From Parity to Büchi with universal trees.
Paweł Parys	Parity Games: Zielonka's Algorithm in Quasi-Polynomial Time
Clément Tamines	Partial Solvers for Generalized Parity Games
Tom van Dijk	Distractions in Parity Games

## THURSDAY, 19.09

### 9:00–11:00 Spotlight Session

Jérôme Leroux: Reachability in Vector Addition Systems is Not Elementary  
Sylvain Schmitz: Reachability in Vector Addition Systems is Primitive-Recursive in Fixed Dimension  
Session Chair: Mikolaj Bojańczyk

### 11:30–12:20 Session 5: VECTOR ADDITION SYSTEMS

Session Chair: Jérôme Leroux

Jan Otop	Long-Run Average Behavior of Vector Addition Systems with States
Wojciech Czerwinski	An Approach to Regular Separability in Vector Addition Systems
Michał Pilipczuk	Reachability for BoBrVASS
Radosław Piórkowski	New pumping technique for 2-VASS
Dominik Velan	Deciding Fast Termination for Probabilistic VASS with Nondeterminism

### 14:20–15:40 Session 6: MIXED TOPICS

Session Chair: Leonid Libkin

Johannes Doleschal	Split-Correctness in Information Extraction
Petr Jancar	Bisimulation Equivalence of First-Order Grammars is ACKERMANN-Complete
Jędrzej Kołodziej	Bisimulation Categoricality
Wojtek Jamroga	Some Things are Easier for the Dumb and the Bright Ones (Beware of the Average!)
Vadim Malvone	Reasoning about Natural Strategic Ability
Bastien Maubert	Reasoning about Quality and Fuzziness of Strategic Behaviours
Sławomir Lasota	Definable isomorphism problem
Oleg Verbitsky	Identifiability of Graphs with Small Color Classes by the Weisfeiler-Leman Algorithm

### 16:10–17:10 Session 7a: BRACKETS, PETRI NETS, AND TIMED AUTOMATA

Session Chair: Sylvain Schmitz

Dmitry Chistikov	Re-pairing brackets
Olivier Finkel	Wadge Degrees of $\omega$ -Languages of Petri Nets
Michał Skrzypczak	On the strength of non-determinism for Buchi VASS
Piotr Hofman	Continuous Reachability for Unordered Data Petri Nets is in PTime
Patrick Totzke	Timed Basic Parallel Processes
Sayan Mukherjee	Fast Algorithms for Handling Diagonal Constraints in Timed Automata

### 16:10–16:50 Session 7b: MARKOV PROCESSES AND STOCHASTIC HYBRID SYSTEMS

Session Chair: Sebastian Siebertz

David Purser	The big-O Problem for Labelled Markov Chains
Jakob Piribauer	Long-run probabilities of path properties
Pierre Vandenholte	Reachability in Stochastic Hybrid Systems
Pranav Ashok	PAC Statistical Model Checking for Markov Decision Processes and Stochastic Games
Ramanathan Srinivasan	Regular Separability and Intersection Emptiness are Independent Problems

### 17:20–18:20 Session 8: AUTOMATA ON WORDS

Session Chair: Christof Löding

Corto Mascle	On Nonnegative Integer Matrices and Short Killing Words
Rafał Stefański	Single use register automata for data words
Nicolas Mazzocchi	Two-way automata with Presburger acceptance
Ismaël Jecker	On Equivalence Problem for Rational Relations
Chris Köcher	Reachability Problems on Partially Lossy Queue Automata
Corentin Barloy	A robust class of linear recurrence sequences


## FRIDAY, 20.09

### 9:00–10:00 Invited talk

Marie Fortin: Expressivity of first-order logic and star-free propositional dynamic logic over ordered structures  
Session Chair: Véronique Bruyère

### 10:30–11:50 Session 9: REGULARITY


Session Chair: Anca Muscholl



Dominik Wojtczak	Omega-Regular Objectives in Model-Free Reinforcement Learning
Simon Jantsch	From Linear Temporal Logic to Unambiguous Büchi Automata
Grzegorz Fabiański	<u>Uniformization of MSO-definable relations on integers</u>
Vincent Michielini	Uniformization problem for class of regular languages: an algebraic approach
Denis Kuperberg	<u>Computational content of cyclic proofs for regular expressions</u>
Émile Hazard	<u>An infinitary proof system for the inclusion of <math>\omega</math>-regular languages</u>
Nathan Lhote	Computability and continuity of regular functions over $\omega$ -words
Christopher Hugenroth	Separating Languages over Infinite Words with Product Automata

### 12:00–13:00 Session 10: MEAN-PAYOFF GAMES, REACHABILITY GAMES, AND PATROLLING GAMES

Session Chair: Guy Avni



Véronique Bruyère	Energy mean-payoff games
Daniele Dell'Erba	Quasi Dominion Measures for Mean-Payoff Games
Pierre Ohlmann	Universal Graphs for Mean Payoff Games
Aline Goeminne	On Relevant Equilibria in Reachability Games
Marie Van Den Bogaard	The Complexity of Subgame Perfect Equilibria in Quantitative Reachability Games
Antonín Kučera	Automatic Synthesis of Efficient Regular Strategies in Adversarial Patrolling Games