



FINAL Program

39th International Colloquium on Automata, Languages and Programming

University of Warwick, July 9 – 13, 2012



Microsoft
Research



THE UNIVERSITY OF
WARWICK

Monday 9 July 2012

Invited Talk. Room MS.02	
08.45 – 09.00	Opening and Welcome
09.00 – 10.00	Stefano Leonardi <i>On Multiple Keyword Sponsored Search Auctions with Budgets</i>

10.00 – 10.30 COFFEE BREAK

Session A1. Room MS.02	
10.30 – 10.50	Inge Li Gørtz, Viswanath Nagarajan and Rishi Saket <i>Stochastic Vehicle Routing with Recourse</i>
10.55 – 11.15	Nicole Megow, Martin Skutella, Jose Verschae and Andreas Wiese <i>The Power of Recourse for Online MST and TSP</i>
11.20 – 11.40	Yossi Azar and Iftah Gamzu <i>Efficient Submodular Function Maximization under Linear Packing Constraints</i>
11.45 – 12.05	Alberto Marchetti-Spaccamela, Cyriel Rutten, Suzanne van der Ster and Andreas Wiese <i>Assigning Sporadic Tasks to Unrelated Parallel Machines</i>
12.10 – 12.30	Siddharth Barman, Shuchi Chawla, David Malec and Seeun Umboh <i>Secretary Problems with Convex Costs</i>

Session C1. Room MS.01	
10.30 – 10.50	Ning Chen, Xiaotie Deng, Hongyang Zhang and Jie Zhang <i>Incentive Ratios of Fisher Markets</i>
10.55 – 11.15	Ilias Diakonikolas, Christos Papadimitriou, George Pierrakos and Yaron Singer <i>Efficiency-Revenue Trade-offs in Auctions</i>
11.20 – 11.40	Khaled Elbassioni <i>A QPTAS for ϵ-Envy-Free Profit-Maximizing Pricing on Line Graphs</i>
11.45 – 12.05	Elias Koutsoupias and Katia Papakonstantinou <i>Contention Issues in Congestion Games</i>
12.10 – 12.30	Fedor Fomin, Petr Golovach, Jesper Nederlof and Michał Pilipczuk <i>Minimizing Rosenthal Potential in Multicast Games</i>

Session B1. Room MS.05	
10.30 – 10.50	Albert Atserias and Anuj Dawar <i>Degree Lower Bounds of Tower-Type for Approximating Formulas with Parity Quantifiers</i>
10.55 – 11.15	Anuj Dawar and Bjarki Holm <i>Pebble Games with Algebraic Rules</i>
11.20 – 11.40	John Fearnley and Sven Schewe <i>Time and Parallelizability Results for Parity Games with Bounded Treewidth</i>
11.45 – 12.05	Manfred Kufleitner and Alexander Lauser <i>Lattices of Logical Fragments over Words</i>
12.10 – 12.30	Tomáš Gavenčiak, Daniel Kral and Sang-Il Oum <i>Deciding First Order Logic Properties of Matroids</i>

12.45 – 14.00 LUNCH AT ROOTES BUILDING

Session A2. Room MS.02	
14.10 – 14.30	Jesper Jansson, Kunihiko Sadakane and Wing-Kin Sung <i>CRAM: Compressed Random Access Memory</i>
14.35 – 14.55	Yuval Emek, Magnus M. Halldorsson and Adi Rosen <i>Space-Constrained Interval Selection</i>
15.00 – 15.20	Artur Jež <i>Faster Fully Compressed Pattern Matching by Recompression</i>
15.25 – 15.45	Karl Bringmann and Konstantinos Panagiotou <i>Efficient Sampling Methods for Discrete Distributions</i>

Session A3. Room MS.01	
14.10 – 14.30	László Babai, Paolo Codenotti and Youming Qiao <i>Polynomial-Time Isomorphism Test for Groups with no Abelian Normal Subgroups</i>
14.35 – 14.55	Lukas Polacek and Ola Svensson <i>Quasi-Polynomial Local Search for Restricted Max-Min Fair Allocation</i>
15.00 – 15.20	Andrew Hughes, A Pavan, Nathan Russell and Alan Selman <i>A Thirty Year Old Conjecture about Promise Problems</i>
15.25 – 15.45	Hiro Ito, Shin-Ichi Tanigawa and Yuichi Yoshida <i>Constant-Time Algorithms for Sparsity Matroids</i>

Session B2. Room MS.05	
14.10 – 14.30	Maribel Fernandez and Albert Rubio <i>Nominal Completion for Rewrite Systems with Binders</i>
14.35 – 14.55	Mikołaj Bojańczyk and Thomas Place <i>Toward Model Theory with Data Values</i>
15.00 – 15.20	Mikołaj Bojańczyk and Sławomir Lasota <i>A Machine-Independent Characterization of Timed Languages</i>
15.25 – 15.45	Andrzej Murawski and Nikos Tzevelekos <i>Algorithmic Games for Full Ground References</i>

15.50 – 16.30 COFFEE BREAK

Best Papers Session. Room MS.02	
16.30 – 16.55	Best paper Track A: Leslie Ann Goldberg and Mark Jerrum <i>The Complexity of Computing the Sign of the Tutte Polynomial (and consequent #P-hardness of Approximation)</i>
17.00 – 17.25	Best paper Track B: Volker Diekert, Manfred Kufleitner, Klaus Reinhardt and Tobias Walter <i>Regular Languages are Church-Rosser Congruential</i>
17.30 – 17.55	Best paper Track C: Piotr Krysta and Berthold Vöcking <i>Online Mechanism Design (Randomized Rounding on the Fly)</i>

18.00 – 19.30 WELCOME RECEPTION – Zeeman Building

Drinks and Canapés

Tuesday 10 July 2012

Invited Talk. Room MS.02	
09.00 – 10.00	Berthold Vöcking <i>Randomised Mechanisms for Multi-Unit Auctions</i>

10.00 – 10.30 COFFEE BREAK

Session A4. Room MS.02	
10.30 – 10.50	Marek Cygan, Stefan Kratsch, Marcin Pilipczuk, Michal Pilipczuk and Magnus Wahlstrom <i>Clique cover and graph separation: New incompressibility results</i>
10.55 – 11.15	Bingkai Lin and Yijia Chen <i>The Parameterized Complexity of k-edge Induced Subgraphs</i>
11.20 – 11.40	Rajesh Chitnis, Marek Cygan, Mohammadtaghi Hajiaghayi and Dániel Marx <i>Directed Subset Feedback Vertex Set is Fixed-Parameter Tractable</i>
11.45 – 12.05	Michael Fellows, Ariel Kulik, Frances Rosamond and Hadas Shachnai <i>Parameterized Approximation via Fidelity Preserving Transformations</i>
12.10 – 12.30	Rahul Santhanam and Srikanth Srinivasan <i>On the Limits of Sparsification</i>

Session A5. Room MS.01	
10.30 – 10.50	Joshua Baron, Rafail Ostrovsky and Ivan Visconti <i>Nearly Simultaneously Resettable Black-Box Zero Knowledge</i>
10.55 – 11.15	Michael Rabin, Yishay Mansour, Muthu Muthukrishnan and Moti Yung <i>Strictly-Black-Box Zero-Knowledge and Efficient Validation of Financial Transactions</i>
11.20 – 11.40	Justin Thaler, Jonathan Ullman and Salil Vadhan <i>Faster Algorithms for Privately Releasing Marginals</i>
11.45 – 12.05	Best Student Paper: Anastasios Zouzias <i>A Matrix Hyperbolic Cosine Algorithm and Applications</i>
12.10 – 12.30	Amit Deshpande, Ravindran Kannan and Nikhil Srivastava <i>Zero-One Rounding of Singular Vectors</i>

Session B3. Room MS.05	
10.30 – 10.50	Best Student Paper: Yaron Velner <i>The Complexity of Mean-Payoff Automaton Expression</i>
10.55 – 11.15	Gilles Dowek and Pablo Arrighi <i>Causal Graph Dynamics</i>
11.20 – 11.40	Patricia Bouyer, Nicolas Markey and Ocan Sankur <i>Robust Reachability in Timed Automata: A Game-based Approach</i>
11.45 – 12.05	Hongfei Fu <i>Computing Game Metrics on Markov Decision Processes</i>
12.10 – 12.30	Tomas Brazdil, Antonin Kucera, Petr Novotný and Dominik Wojtczak <i>Minimizing Expected Termination Time in One-Counter Markov Decision Processes</i>

12.45 – 14.00 BUFFET LUNCH (ZEEMAN BUILDING)

Session A6. Room MS.02	
14.10 – 14.30	Michael Kapralov and Rina Panigrahy <i>NNS Lower Bounds via Metric Expansion for l_∞ and EMD</i>
14.35 – 14.55	T-H. Hubert Chan, Mingfei Li and Li Ning <i>Sparse Fault-Tolerant Spanners for Doubling Metrics with Bounded Hop-Diameter or Degree</i>
15.00 – 15.20	Danny Z. Chen and Haitao Wang <i>Computing the Visibility Polygon of an Island in a Polygonal Domain</i>

Session A7. Room MS.01	
14.10 – 14.30	Jens M. Schmidt <i>Certifying 3-Connectivity in Linear Time</i>
14.35 – 14.55	Pushkar Tripathi, Prasad Tetali and Kevin Costello <i>Stochastic Matching with Commitment</i>
15.00 – 15.20	Loukas Georgiadis and Robert Tarjan <i>Dominators, Directed Bipolar Orders, and Independent Spanning Trees</i>

Session C2. Room MS.05	
14.10 – 14.30	Daniel M. Kane, Kurt Mehlhorn, Thomas Sauerwald and He Sun <i>Counting Arbitrary Subgraphs in Data Streams</i>
14.35 – 14.55	Marcel Ochel, Klaus Radke and Berthold Vöcking <i>Online Packing with Gradually Improving Capacity Estimations with Applications to Network Lifetime Maximization</i>
15.00 – 15.20	Michael Goodrich and Michael Mitzenmacher <i>Anonymous Card Shuffling and its Applications to Parallel Mixnets</i>

15.25 – 16.00 COFFEE BREAK

Turing Talk and Presburger Award 2012. Room MS.02	
16.00 – 17.00	Alan Turing Talk: David Harel <i>Standing on the Shoulders of a Giant: One Person's Experience of Turing's Impact</i>
17.00 – 17.05	Presentation of Presburger Award winners
17.05 – 17.30	Presburger Award 2012 co-winner: Venkatesan Guruswami
17.30 – 17.55	Presburger Award 2012 co-winner: Mihai Patrascu (talk by Mikkel Thorup)

EATCS General Assembly. Room MS.02	
18.00 – 19.30	

Wednesday 11 July 2012

Invited Talk. Room MS.02	
09.00 – 10.00	Gilles Dowek <i>A Theory Independent Curry-De Bruijn-Howard Correspondence</i>

10.00 – 10.30 COFFEE BREAK

Session A8. Room MS.02	
10.30 – 10.50	Elad Verbin and Qin Zhang <i>Rademacher-Sketch: A Dimensionality-Reducing Embedding for Sum-Product Norms, with an Application to Earth-Mover Distance</i>
10.55 – 11.15	Maria Florina Balcan and Yingyu Liang <i>Clustering under Perturbation Resilience</i>
11.20 – 11.40	Justin Hsu, Sanjeev Khanna and Aaron Roth <i>Distributed Private Heavy Hitters</i>
11.45 – 12.05	Aditya Bhaskara, Moses Charikar, Rajsekar Manokaran and Aravindan Vijayaraghavan <i>Quadratic Programming with a Ratio Objective</i>
12.10 – 12.30	Kousha Etessami, Alistair Stewart and Mihalis Yannakakis <i>Polynomial Time Algorithms for Branching Markov Decision Processes and Probabilistic Min(Max) Polynomial Bellman Equations</i>

Session B4. Room MS.01	
10.30 – 10.50	C.-H. Luke Ong and Takeshi Tsukada <i>Two-Level Game Semantics, Intersection Types and Recursion Schemes</i>
10.55 – 11.15	Sylvain Salvati, Giulio Manzonetto, Mai Gehrke and Henk Barendregt <i>Loader and Urzyczyn are Logically Related</i>
11.20 – 11.40	Chris Broadbent, Arnaud Carayol, Matthew Hague and Olivier Serre <i>A Saturation Method for Collapsible Pushdown Systems</i>
11.45 – 12.05	Christopher Broadbent <i>Prefix Rewriting for Nested-Words and Collapsible Pushdown Automata</i>
12.10 – 12.30	Szymon Toruńczyk <i>Languages of Profinite Words and the Limitedness Problem</i>

Session C3. Room MS.05	
10.30 – 10.50	Reuven Bar-Yehuda, Erez Kantor, Shay Kutten and Dror Rawitz <i>Growing Half-Balls: Minimizing Storage and Communication Costs in CDNs</i>
10.55 – 11.15	Nishanth Chandran, Juan Garay and Rafail Ostrovsky <i>Edge Fault Tolerance on Sparse Networks</i>
11.20 – 11.40	Adrian Kosowski, Bi Li, Nicolas Nisse and Karol Suchan <i>k-Chordal Graphs: from Cops and Robber to Compact Routing via Treewidth</i>
11.45 – 12.05	Marco Chiesa, Giuseppe Di Battista, Thomas Erlebach and Maurizio Patrignani <i>Computational Complexity of Traffic Hijacking under BGP and S-BGP</i>
12.10 – 12.30	Navendu Jain, Ishai Menache, Joseph Naor and F. Bruce Shepherd <i>Topology-Aware VM Migration in Bandwidth Oversubscribed Datacenter Networks</i>

12.35 – 13.00 COLLECT YOUR PACKED LUNCH - REFRESHMENT AREA

13.00 – 13.10 CONFERENCE PHOTOGRAPH

13.15 – 18.00 VISIT TO BLETCHLEY PARK



18.00 – 20.00 CONFERENCE BBQ – ZEEMAN BUILDING

Thursday 12 July 2012

Invited Talk. Room MS.02	
09.00 – 10.00	Daniel A. Spielman <i>Algorithms, Graph Theory, and the Solution of Laplacian Linear Equation</i>

10.00 – 10.30 COFFEE BREAK

Session A9. Room MS.02	
10.30 – 10.50	Stacey Jeffery, Robin Kothari and Frédéric Magniez <i>Improving Quantum Query Complexity of Boolean Matrix Multiplication Using Graph Collision</i>
10.55 – 11.15	Best Student Paper: Shelby Kimmel <i>Quantum Adversary (Upper) Bound</i>
11.20 – 11.40	Sevag Gharibian and Julia Kempe <i>Hardness of Approximation for Quantum Problems</i>
11.45 – 12.05	Andris Ambainis, Artūrs Bačkurs, Kaspars Balodis, Dmitry Kravchenko, Raitis Ozols, Juris Smotrovs and Madars Virza <i>Quantum Strategies are Better than Classical in Almost Any XOR Game</i>
12.10 – 12.30	S. Laplante, V. Lerays and J. Roland <i>Classical and Quantum Partition Bound and Detector Inefficiency</i>

Session A10. Room MS.01	
10.30 – 10.50	Sungjin Im, Viswanath Nagarajan and Ruben Van Der Zwaan <i>Minimum Latency Submodular Cover</i>
10.55 – 11.15	Robert Krauthgamer and Tamar Zondiner <i>Preserving Terminal Distances using Minors</i>
11.20 – 11.40	Marco Molinaro and R Ravi <i>Geometry of Online Packing Linear Programs</i>
11.45 – 12.05	Anupam Gupta and Viswanath Nagarajan <i>Approximating Sparse Covering Integer Programs Online</i>
12.10 – 12.30	Bundit Laekhanukit, Shayan Oveis Gharan and Mohit Singh <i>An Improved Approximation Algorithm for The Minimum Size k-Arc Connected Subgraph Problem</i>

Session B5. Room MS.05	
10.30 – 10.50	Luca Aceto, Arnaud Carayol, Zoltan Esik and Anna Ingolfsdottir <i>Algebraic Synchronization Trees and Processes</i>
10.55 – 11.15	Tadeusz Litak, Dirk Pattinson, Katsuhiko Sano and Lutz Schröder <i>Coalgebraic Predicate Logic</i>
11.20 – 11.40	Marcelo Fiore <i>Discrete Generalised Polynomial Functors</i>
11.45 – 12.05	Uday Reddy and Brian Dunphy <i>An Automata-Theoretic Model of Idealized Algol</i>
12.10 – 12.30	Grigore Rosu and Andrei Stefanescu <i>Towards a Unified Theory of Operational and Axiomatic Semantics</i>

12.35 – 14.00 BUFFET LUNCH (ZEEMAN BUILDING)

Session A11. Room MS.02	
14.10 – 14.30	Arash Farzan, Ian Munro and Rajeev Raman <i>Succinct Indices for Range Queries with applications to Orthogonal Range Maxima</i>
14.35 – 14.55	Prosenjit Bose, Sebastien Collette, Rolf Fagerberg and Stefan Langerman <i>De-amortizing Binary Search Trees</i>
15.00 – 15.20	Yaoyun Shi and Xiaodi Wu <i>Epsilon-net Method for Optimizations over Separable States</i>
15.25 – 15.45	Anupam Gupta and Kevin Lewi <i>The Online Metric Matching Problem for Doubling Metrics</i>

Session A12. Room MS.01	
14.10 – 14.30	Bruno Bauwens <i>Complexity of Complexity and Maximal Plain versus Prefix-free Kolmogorov Complexity</i>
14.35 – 14.55	Uriel Feige and Shlomo Jozeph <i>Universal Factor Graphs</i>
15.00 – 15.20	Yishay Mansour, Aviad Rubinfeld, Shai Vardi and Ning Xie <i>Converting Online Algorithms To Local Computation Algorithms</i>
15.25 – 15.45	Michael Dinitz, Guy Kortsarz and Ran Raz <i>Label Cover Instances with Large Girth and the Hardness of Approximating Basic k-Spanner</i>

Session C4. Room MS.05	
14.10 – 14.30	David Peleg, Liam Roditty and Elad Tal <i>Distributed Algorithms for Network Diameter and Girth</i>
14.35 – 14.55	Best Student Paper: Leonid Barenboim <i>On the Locality of NP-Complete Problems</i>
15.00 – 15.20	Andrew Berns, James Hegeman and Sriram Pemmaraju <i>Super-Fast Distributed Algorithms for Metric Facility Location</i>
15.25 – 15.45	Yoann Dieudonne and Andrzej Pelc <i>Deterministic Network Exploration by Anonymous Silent Agents with Local Traffic Reports</i>

15.50 – 16.30 COFFEE BREAK

Awards Ceremony. Room MS.02	
16.30 – 16.45	Award Ceremony: Gödel Prize 2012 and EATCS Award 2012
16.45 – 17.45	Gödel Prize 2012 winners Elias Koutsoupias, Noam Nisan, Christos H. Papadimitriou, Amir Ronen, Tim Roughgarden, Éva Tardos
17.45 – 18.15	EATCS Award 2012 winner Moshe Vardi

**18.30 – 22.30 Stoneleigh Abbey
CONFERENCE DINNER**

Friday 13 July 2012

Invited Talk. Room MS.02	
09.00 – 10.00	Kohei Honda <i>Session Types and Distributed Computing</i>

10.00 – 10.30 COFFEE BREAK

Session A13. Room MS.02	
10.30 – 10.50	Niv Buchbinder, Seffi Naor, R. Ravi and Mohit Singh <i>Approximation Algorithms for Online Weighted Rank Function Maximization under Matroid Constraints</i>
10.55 – 11.15	Moses Charikar and Shi Li <i>A Dependent LP-rounding Approach for the k-Median Problem</i>
11.20 – 11.40	Barna Saha and Samir Khuller <i>Set Cover Revisited: Hypergraph Cover with Hard Capacities</i>
11.45 – 12.05	Jaroslav Byrka and Bartosz Rybicki <i>Improved LP-rounding Approximation Algorithm for k-level Uncapacitated Facility Location</i>
12.10 – 12.30	Chandra Chekuri, Alina Ene and Ali Vakilian <i>Node-weighted Network Design in Planar and Minor-closed Families of Graphs</i>

Session A14. Room MS.01	
10.30 – 10.50	Robert Crowston, Mark Jones and Matthias Mnich <i>Max-Cut Parameterized Above the Edwards-Erdős Bound</i>
10.55 – 11.15	Stefan Kratsch, Marcin Pilipczuk, Michał Pilipczuk and Magnus Wahlström <i>Fixed-Parameter Tractability of Multicut in Directed Acyclic Graphs</i>
11.20 – 11.40	Daniel Lokshtanov and M. S. Ramanujan <i>Parameterized Tractability of Multiway Cut with Parity Constraints</i>
11.45 – 12.05	Dániel Marx <i>A Tight Lower Bound for Planar Multiway Cut with Fixed Number of Terminals</i>
12.10 – 12.30	Philip Klein and Dániel Marx <i>Solving Planar k-Terminal Cut in $O(n^{c\sqrt{k}})$ Time</i>

Session B6. Room MS.05	
10.30 – 10.50	Mikołaj Bojańczyk and Thomas Place <i>Regular Languages of Infinite Trees that are Boolean Combinations of Open Sets</i>
10.55 – 11.15	Denis Kuperberg and Michael Vanden Boom <i>On the Expressive Power of Cost Logics over Infinite Words</i>
11.20 – 11.40	Stanislav Kikot, Roman Kontchakov, Vladimir Podolskii and Michael Zakharyashev <i>Exponential Lower Bounds and Separation for Query Rewriting</i>
11.45 – 12.05	Michael Benedikt, Pierre Bourhis and Pierre Senellart <i>Monadic Datalog Containment</i>
12.10 – 12.30	Rajeev Alur and Loris D'Antoni <i>Streaming Tree Transducers</i>

12.45 – 14.00 BUFFET LUNCH (ZEEMAN BUILDING)

Session A15. Room MS.02	
14.10 – 14.30	Magnus M. Halldorsson, Xiaoming Sun, Mario Szegedy and Chengu Wang <i>Streaming and Communication Complexity of Clique Approximation</i>
14.35 – 14.55	Reut Levi, Dana Ron and Ronitt Rubinfeld <i>Testing Similar Means</i>
15.00 – 15.20	Deeparnab Chakrabarty and Zhiyi Huang <i>Testing Coverage Functions</i>
15.25 – 15.45	Anil Ada, Arkadev Chattopadhyay, Omar Fawzi and Phuong Nguyen <i>The NOF Multiparty Communication Complexity of Composed Functions</i>

Session A16. Room MS.01	
14.10 – 14.30	Serge Gaspers and Stefan Szeider <i>Backdoors to Acyclic SAT</i>
14.35 – 14.55	Anindya De, Ilias Diakonikolas and Rocco Servedio <i>The Inverse Shapley Value Problem</i>
15.00 – 15.20	Matthew Patitz, Robert Schweller, Bin Fu and Robert Sheline <i>Self-Assembly with Geometric Tiles</i>
15.25 – 15.45	Dimitris Achlioptas and Ricardo Menchaca-Mendez <i>Unsatisfiability Bounds for Random CSPs from an Energetic Interpolation Method</i>

Session C5. Room MS.05	
14.10 – 14.30	Kshipra Bhawalkar, Jon Kleinberg, Kevin Lewi, Tim Roughgarden and Aneesh Sharma <i>Preventing Unraveling in Social Networks: The Anchored k-Core Problem</i>
14.35 – 14.55	Luca Gugelmann, Konstantinos Panagiotou and Ueli Peter <i>Hyperbolic Random Graphs: Degree Sequence and Clustering</i>
15.00 – 15.20	Ran Gelles, Rafail Ostrovsky and Kina Winoto <i>Multi-User Equality Testing and Its Applications</i>
15.25 – 15.45	Adam Groce, Jonathan Katz, Aishwarya Thiruvengadam and Vassilis Zikas <i>Byzantine Agreement with a Rational Adversary</i>

15.50

CONFERENCE CLOSE