

Table of Contents – Part I

Invited Talks

Sporadic Solutions to Zero-One Exclusion Tasks	1
<i>Eli Gafni and Maurice Herlihy</i>	
Verifying and Synthesizing Software with Recursive Functions (Invited Contribution)	11
<i>Viktor Kuncak</i>	

Track A: Algorithms, Complexity, and Games

Weak Parity	26
<i>Scott Aaronson, Andris Ambainis, Kaspars Balodis, and Mohammad Bavarian</i>	
Consequences of Faster Alignment of Sequences	39
<i>Amir Abboud, Virginia Vassilevska Williams, and Oren Weimann</i>	
Distance Labels with Optimal Local Stretch	52
<i>Ittai Abraham and Shiri Chechik</i>	
Time-Expanded Packings	64
<i>David Adjiashvili, Sandro Bosio, Robert Weismantel, and Rico Zenklusen</i>	
Deterministic Rectangle Enclosure and Offline Dominance Reporting on the RAM	77
<i>Peyman Afshani, Timothy M. Chan, and Konstantinos Tsakalidis</i>	
The Tropical Shadow-Vertex Algorithm Solves Mean Payoff Games in Polynomial Time on Average	89
<i>Xavier Allamigeon, Pascal Benchimol, and Stéphane Gaubert</i>	
Tighter Relations between Sensitivity and Other Complexity Measures	101
<i>Andris Ambainis, Mohammad Bavarian, Yihan Gao, Jieming Mao, Xiaoming Sun, and Song Zuo</i>	
On Hardness of Jumbled Indexing	114
<i>Amihod Amir, Timothy M. Chan, Moshe Lewenstein, and Noa Lewenstein</i>	
Morphing Planar Graph Drawings Optimally	126
<i>Patrizio Angelini, Giordano Da Lozzo, Giuseppe Di Battista, Fabrizio Frati, Maurizio Patrignani, and Vincenzo Roselli</i>	

Incremental Algorithm for Maintaining DFS Tree for Undirected Graphs	138
<i>Surender Baswana and Shahbaz Khan</i>	
On the Role of Shared Randomness in Simultaneous Communication ...	150
<i>Mohammad Bavarian, Dmitry Gavinsky, and Tsuyoshi Ito</i>	
Short PCPs with Projection Queries	163
<i>Eli Ben-Sasson and Emanuele Viola</i>	
Star Partitions of Perfect Graphs	174
<i>René van Bevern, Robert Brederick, Laurent Bulteau, Jiehua Chen, Vincent Froese, Rolf Niedermeier, and Gerhard J. Woeginger</i>	
Coordination Mechanisms for Selfish Routing over Time on a Tree	186
<i>Sayan Bhattacharya, Janardhan Kulkarni, and Vahab Mirrokni</i>	
On Area-Optimal Planar Graph Drawings	198
<i>Therese Biedl</i>	
Shortest Two Disjoint Paths in Polynomial Time	211
<i>Andreas Björklund and Thore Husfeldt</i>	
Listing Triangles	223
<i>Andreas Björklund, Rasmus Pagh, Virginia Vassilevska Williams, and Uri Zwick</i>	
On DNF Approximators for Monotone Boolean Functions	235
<i>Eric Blais, Johan Håstad, Rocco A. Servedio, and Li-Yang Tan</i>	
Internal DLA: Efficient Simulation of a Physical Growth Model (Extended Abstract)	247
<i>Karl Bringmann, Fabian Kuhn, Konstantinos Panagiotou, Ueli Peter, and Henning Thomas</i>	
Lower Bounds for Approximate LDCs	259
<i>Jop Briët, Zeev Dvir, Guangda Hu, and Shubhangi Saraf</i>	
Holographic Algorithms Beyond Matchgates	271
<i>Jin-Yi Cai, Heng Guo, and Tyson Williams</i>	
Testing Probability Distributions Underlying Aggregated Data	283
<i>Clément Canonne and Ronitt Rubinfeld</i>	
Parallel Repetition of Entangled Games with Exponential Decay via the Superposed Information Cost	296
<i>André Chailloux and Giannicola Scarpa</i>	
The Bose-Hubbard Model is QMA-complete	308
<i>Andrew M. Childs, David Gosset, and Zak Webb</i>	

Characterization of Binary Constraint System Games	320
<i>Richard Cleve and Rajat Mittal</i>	
Fast Algorithms for Constructing Maximum Entropy Summary Trees . . .	332
<i>Richard Cole and Howard Karloff</i>	
Thorp Shuffling, Butterflies, and Non-markovian Couplings	344
<i>Artur Czumaj and Berthold Vöcking</i>	
Dynamic Complexity of Directed Reachability and Other Problems	356
<i>Samir Datta, William Hesse, and Raghav Kulkarni</i>	
One Tile to Rule Them All: Simulating Any Tile Assembly System with a Single Universal Tile	368
<i>Erik D. Demaine, Martin L. Demaine, Sándor P. Fekete, Matthew J. Patitz, Robert T. Schweller, Andrew Winslow, and Damien Woods</i>	
Canadians Should Travel Randomly	380
<i>Erik D. Demaine, Yamming Huang, Chung-Shou Liao, and Kunihiko Sadakane</i>	
Efficiency Guarantees in Auctions with Budgets	392
<i>Shahar Dobzinski and Renato Paes Leme</i>	
Parameterized Complexity of Bandwidth on Trees	405
<i>Markus Sortland Dregi and Daniel Lokshtanov</i>	
Testing Equivalence of Polynomials under Shifts	417
<i>Zeev Dvir, Rafael Mendes de Oliveira, and Amir Shpilka</i>	
Optimal Analysis of Best Fit Bin Packing	429
<i>György Dósa and Jiří Sgall</i>	
Light Spanners	442
<i>Michael Elkin, Ofer Neiman, and Shay Solomon</i>	
Semi-Streaming Set Cover (Extended Abstract)	453
<i>Yuval Emek and Adi Rosén</i>	
Online Stochastic Reordering Buffer Scheduling	465
<i>Hossein Esfandiari, MohammadTaghi Hajiaghayi, Mohammad Reza Khani, Vahid Liaghat, Hamid Mahini, and Harald Räcke</i>	
Demand Queries with Preprocessing	477
<i>Uriel Feige and Shlomo Jozeph</i>	
Algorithmic Aspects of Regular Graph Covers with Applications to Planar Graphs	489
<i>Jiří Fiala, Pavel Klavík, Jan Kratochvíl, and Roman Nedela</i>	

Public vs Private Coin in Bounded-Round Information	502
<i>Mark Braverman and Ankit Garg</i>	
En Route to the Log-Rank Conjecture: New Reductions and Equivalent Formulations	514
<i>Dmitry Gavinsky and Shachar Lovett</i>	
Improved Submatrix Maximum Queries in Monge Matrices	525
<i>Paweł Gawrychowski, Shay Mozes, and Oren Weimann</i>	
For-All Sparse Recovery in Near-Optimal Time	538
<i>Anna C. Gilbert, Yi Li, Ely Porat, and Martin J. Strauss</i>	
Families with Infants: A General Approach to Solve Hard Partition Problems	551
<i>Alexander Golovnev, Alexander S. Kulikov, and Ivan Mihajlin</i>	
Changing Bases: Multistage Optimization for Matroids and Matchings	563
<i>Anupam Gupta, Kunal Talwar, and Udi Wieder</i>	
Near-Optimal Online Algorithms for Prize-Collecting Steiner Problems	576
<i>MohammadTaghi Hajiaghayi, Vahid Liaghat, and Debmalaya Panigrahi</i>	
Nearly Linear-Time Model-Based Compressive Sensing	588
<i>Chinmay Hegde, Piotr Indyk, and Ludwig Schmidt</i>	
Breaking the PPSZ Barrier for Unique 3-SAT	600
<i>Timon Hertli</i>	
Privately Solving Linear Programs	612
<i>Justin Hsu, Aaron Roth, Tim Roughgarden, and Jonathan Ullman</i>	
How Unsplittable-Flow-Covering Helps Scheduling with Job-Dependent Cost Functions	625
<i>Wiebke Höhn, Julián Mestre, and Andreas Wiese</i>	
Why Some Heaps Support Constant-Amortized-Time Decrease-Key Operations, and Others Do Not	637
<i>John Iacono and Özgür Özkan</i>	
Partial Garbling Schemes and Their Applications	650
<i>Yuval Ishai and Hoeteck Wee</i>	
On the Complexity of Trial and Error for Constraint Satisfaction Problems	663
<i>Gábor Ivanyos, Raghav Kulkarni, Youming Qiao, Miklos Santha, and Aarthi Sundaram</i>	

Information Theoretical Cryptogenography	676
<i>Sune K. Jakobsen</i>	
The Complexity of Somewhat Approximation Resistant Predicates	689
<i>Subhash Khot, Madhur Tulsiani, and Pratik Worah</i>	
Approximate Nonnegative Rank Is Equivalent to the Smooth Rectangle Bound	701
<i>Gillat Kol, Shay Moran, Amir Shpilka, and Amir Yehudayoff</i>	
Distance Oracles for Time-Dependent Networks	713
<i>Spyros Kontogiannis and Christos Zaroliagis</i>	
Efficient Indexing of Necklaces and Irreducible Polynomials over Finite Fields	726
<i>Swastik Kopparty, Mrinal Kumar, and Michael Saks</i>	
Coloring Relatives of Interval Overlap Graphs via On-line Games	738
<i>Tomasz Krawczyk and Bartosz Walczak</i>	
Superpolynomial Lower Bounds for General Homogeneous Depth 4 Arithmetic Circuits	751
<i>Mrinal Kumar and Shubhangi Saraf</i>	
Testing Forest-Isomorphism in the Adjacency List Model	763
<i>Mitsuru Kusumoto and Yuichi Yoshida</i>	
Parameterized Approximation Schemes Using Graph Widths	775
<i>Michael Lampis</i>	
FPTAS for Weighted Fibonacci Gates and Its Applications	787
<i>Pinyan Lu, Menghui Wang, and Chihao Zhang</i>	
Parameterized Algorithms to Preserve Connectivity	800
<i>Manu Basavaraju, Fedor V. Fomin, Petr Golovach, Pranabendu Misra, M.S. Ramanujan, and Saket Saurabh</i>	
Nonuniform Graph Partitioning with Unrelated Weights	812
<i>Konstantin Makarychev and Yury Makarychev</i>	
Precedence-Constrained Scheduling of Malleable Jobs with Preemption	823
<i>Konstantin Makarychev and Debmalaya Panigrahi</i>	
Unbounded Entanglement Can Be Needed to Achieve the Optimal Success Probability	835
<i>Laura Mančinska and Thomas Vidick</i>	
QCSP on Semicomplete Digraphs	847
<i>Petar Dapić, Petar Marković, and Barnaby Martin</i>	

Fast Pseudorandomness for Independence and Load Balancing [Extended Abstract]	859
<i>Raghu Meka, Omer Reingold, Guy N. Rothblum, and Ron D. Rothblum</i>	
Determining Majority in Networks with Local Interactions and Very Small Local Memory	871
<i>George B. Mertzios, Sotiris E. Nikolettseas, Christoforos L. Raptopoulos, and Paul G. Spirakis</i>	
Lower Bounds for Oblivious Subspace Embeddings	883
<i>Jelani Nelson and Huy L. Nguyễn</i>	
On Input Indistinguishable Proof Systems	895
<i>Rafail Ostrovsky, Giuseppe Persiano, and Ivan Visconti</i>	
Secure Computation Using Leaky Tokens	907
<i>Manoj Prabhakaran, Amit Sahai, and Akshay Wadia</i>	
An Improved Interactive Streaming Algorithm for the Distinct Elements Problem	919
<i>Hartmut Klauck and Ved Prakash</i>	
A Faster Parameterized Algorithm for Treedepth	931
<i>Felix Reidl, Peter Rossmanith, Fernando Sánchez Villaamil, and Somnath Sikdar</i>	
Pseudorandom Graphs in Data Structures	943
<i>Omer Reingold, Ron D. Rothblum, and Udi Wieder</i>	
Sampling-Based Proofs of Almost-Periodicity Results and Algorithmic Applications	955
<i>Eli Ben-Sasson, Noga Ron-Zewi, Madhur Tulsiani, and Julia Wolf</i>	
The Mondschein Sequence	967
<i>Jens M. Schmidt</i>	
Balanced Allocations: A Simple Proof for the Heavily Loaded Case	979
<i>Kunal Talwar and Udi Wieder</i>	
Close to Uniform Prime Number Generation with Fewer Random Bits	991
<i>Pierre-Alain Fouque and Mehdi Tibouchi</i>	
Optimal Strong Parallel Repetition for Projection Games on Low Threshold Rank Graphs	1003
<i>Madhur Tulsiani, John Wright, and Yuan Zhou</i>	
Sparsifier Random 3-SAT Refutation Algorithms and the Interpolation Problem (Extended Abstract)	1015
<i>Iddo Zameret</i>	

On Learning, Lower Bounds and (un)Keeping Promises	1027
<i>Ilya Volkovich</i>	
Certificates in Data Structures	1039
<i>Yaoyu Wang and Yitong Yin</i>	
Optimal Query Complexity for Estimating the Trace of a Matrix	1051
<i>Karl Wimmer, Yi Wu, and Peng Zhang</i>	
Faster Separators for Shallow Minor-Free Graphs via Dynamic Approximate Distance Oracles	1063
<i>Christian Wulff-Nilsen</i>	
Spatial Mixing of Coloring Random Graphs	1075
<i>Yitong Yin</i>	
Author Index	1087