28th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2017)

Barcelona, Spain
16-19 January 2017

Volume 1 of 4

Editor:

Philip N. Klein

ISBN: 978-1-5108-3635-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by SIAM: Society for Industrial and Applied Mathematics
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact SIAM: Society for Industrial and Applied Mathematics
at the address below.

SIAM
3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA

Phone: (215) 382-9800
Fax: (215) 386-7999

siambooks@siam.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

Proximity in the Age of Distraction: Robust Approximate Nearest Neighbor Search 1
Sariel Har-Peled, Sepideh Mahabadi

High-dimensional Approximate r-nets 16
Georgia Avarikioti, Ioannis Z. Emiris, Loukas Kavouras, Ioannis Psarros

A Framework for Similarity Search with Space-Time Tradeoffs using Locality-Sensitive Filtering 31
Tobias Christiani

Optimal Hashing-based Time-Space Trade-offs for Approximate Near Neighbors 47
Alexandr Andoni, Thijs Laarhoven, Ilya Razenshteyn, Erik Waingarten

LSH Forest: Practical Algorithms Made Theoretical 67
Alexandr Andoni, Ilya Razenshteyn, Negev Shekel Nosatzki

Faster Approximation Schemes for the Two-dimensional Knapsack Problem 79
Sandy Heydrich, Andreas Wiese

Split Packing: An Algorithm for Packing Circles with Optimal Worst-Case Density 99
Sebastian Morr

Stochastic k-Center and j-Flat-Center Problems 110
Lingxiao Huang, Jian Li

Local Search for Max-Sum Diversification 130
Alfonso Cevallos, Friedrich Eisenbrand, Rico Zenklusen

Maximum Scatter TSP in Doubling Metrics 143
László Kozma, Tobias Mömke

Matrix Balancing in L_p Norms: Bounding the Convergence Rate of Osborne's Iteration 154
Rafail Ostrovsky, Yuval Rabani, Arman Yousefi

Decidability of the Membership Problem for 2 × 2 integer matrices 170
Igor Potapov, Pavel Semukhin

The Identity Problem for Matrix Semigroups in $SL_2(Z)$ is NP-Complete 187
Paul C. Bell, Mika Hirvensalo, Igor Potapov

Exploring an Infinite Space with Finite Memory Scouts 207
Lihi Cohen, Yuval Emek, Oren Louidor, Jara Uitto

Universal Shape Replicators via Self-Assembly with Attractive and Repulsive Forces 225
Cameron Chalk, Erik D. Demaine, Martin L. Demaine, Eric Martinez, Robert Schweller, Luis Vega, Tim Wylie

Parameter-free Locality Sensitive Hashing for Spherical Range Reporting 239
Thomas D. Ahle, Martin Aumüller, Rasmus Pagh

Distance Sensitive Bloom Filters Without False Negatives 257
Mayank Goswami, Rasmus Pagh, Francesco Silvestri, Johan Sivertsen

Optimal Approximate Polytope Membership 270
Sunil Arya, Guilherme D. da Fonseca, David M. Mount

Massively-Parallel Similarity Join, Edge-Isoperimetry, and Distance Correlations on the Hypercube 289
Paul Beame, Cyrus Rashtchian

Even Delta-Matroids and the Complexity of Planar Boolean CSPs 307
Alexandr Kazda, Vladimir Kolmogorov, Michal Rolínek

Linear Diophantine Equations, Group CSPs, and Graph Isomorphism 327
Christoph Berkholz, Martin Grohe

Robust Algorithms with Polynomial Loss for Near-unanimity CSPs 340
Víctor Dalmau, Marcin Kozik, Andrei Krokhin, Konstantin Makarychev, Yury Makarychev, Jakub Opršal

Parameterized Algorithms for Constraint Satisfaction Problems Above Average with Global Cardinality Constraints 358
Xue Chen, Yuan Zhou

Hardness of Permutation Pattern Matching 378
Vít Jelínek, Jan Kyncl

pBWT: Achieving Succinct Data Structures for Parameterized Pattern Matching and Related Problems 397
Arnab Ganguly, Rahul Shah, Sharma V. Thankachan

Space-Efficient Construction of Compressed Indexes in Deterministic Linear Time 408
J. Ian Munro, Gonzalo Navarro, Yakov Nekrich

Sparse Suffix Tree Construction in Optimal Time and Space 425
Pawel Gawrychowski, Tomasz Kociumaka

Fully Dynamic All-pairs Shortest Paths with Worst-case Update-time Revisited 440
Ittai Abraham, Shiri Chechik, Sebastian Krinninger

Deterministic Partially Dynamic Single Source Shortest Paths for Sparse Graphs 453
Aaron Bernstein, Shiri Chechik

Fully Dynamic Approximate Maximum Matching and Minimum Vertex Cover in $O(\log^3 n)$ Worst Case Update Time 470
Sayan Bhattacharya, Monika Henzinger, Danupon Nanongkai

Connectivity Oracles for Graphs Subject to Vertex Failures 490
Ran Duan, Seth Pettie

Fully Dynamic Connectivity in O(log n(log log n)^2) Amortized Expected Time 510
Shang-En Huang, Dawei Huang, Tsvi Kopelowitz, Seth Pettie
Best-Response Dynamics in Combinatorial Auctions with Item Bidding 521
Paul Dütting, Thomas Kesselheim
Approximating Spanners and Directed Steiner Forest: Upper and Lower Bounds 534
Eden Chlamtác, Michael Dinitz, Guy Kortsarz, Bundit Laekhanukit
Convergence of Incentive-Driven Dynamics in Fisher Markets 554
Krishnamurthy Dvijotham, Yuval Rabani, Leonard J. Schulman
A Hierarchy of Lower Bounds for Sublinear Additive Spanners 568
Amir Abboud, Greg Bodwin, Seth Pettie
Totally Unimodular Congestion Games 577
Alberto Del Pia, Michael Ferris, Carla Michini
LAST but not Least: Online Spanners for Buy-at-Bulk 589
Anupam Gupta, R. Ravi, Kunal Talwar, Seeun William Umboh
Linear Size Distance Preservers 600
Greg Bodwin
Playing Anonymous Games using Simple Strategies 616
Yu Cheng, Ilias Diakonikolas, Alistair Stewart
Efficient Algorithms for Constructing Very Sparse Spanners and Emulators 632
Michael Elkin, Ofer Neiman
Computing Walrasian Equilibria: Fast Algorithms and Structural Properties 650
Renato Paes Leme, Sam Chiu-wai Wong
Metric Embeddings with Outliers 670
Anastasios Sidiropoulos, Dingkang Wang, Yusu Wang

VOLUME 2

Probabilistic Clustering of High Dimensional Norms 690
Assaf Naor
Near-Optimal (Euclidean) Metric Compression 710
Piotr Indyk, Tal Wagner
A Treehouse with Custom Windows: Minimum Distortion Embeddings into Bounded Treewidth Graphs 724
Amir Nayyeri, Benjamin Raichel
Beyond Metric Embedding: Approximating Group Steiner Trees on Bounded Treewidth Graphs 737
Parinya Chalermsook, Syamantak Das, Bundit Laekhanukit, Daniel Vaz
Negative-Weight Shortest Paths and Unit Capacity Minimum Cost Flow in $\tilde{O}$ ($m^{10/7}$ log W) Time (Extended Abstract) 752
Michael B. Cohen, Aleksander Madry, Piotr Sankowski, Adrian Vladu
Generalized Preconditioning and Undirected Minimum-Cost Flow 772
Jonah Sherman
Scaling Algorithms for Weighted Matching in General Graphs 781
Ran Duan, Seth Pettie, Hsin-Hao Su
Near-Linear Time Approximation Schemes for Some Implicit Fractional Packing Problems 801
Chandra Chekuri, Kent Quanrud
Fast and Memory-Efficient Algorithms for Evacuation Problems 821
Miriam Schloter, Martin Skutella
Approximate Hierarchical Clustering via Sparsest Cut and Spreading Metrics 841
Moses Charikar, Vaggos Chatziafratis
Approximating Multicut and the Demand Graph 855
Chandra Chekuri, Vivek Madan
Minimum Fill-In: Inapproximability and Almost Tight Lower Bounds 875
Yixin Cao, R. B. Sandeep
Minimizing the Union: Tight Approximations for Small Set Bipartite Vertex Expansion 881
Eden Chlamtác, Michael Dinitz, Yury Makarychev
Approximation Algorithms for Label Cover and The Log-Density Threshold 900
Eden Chlamtác, Pasin Manurangsi, Dana Moshkovitz, Aravindan Vijayaraghavan
An Axiomatic and an Average-Case Analysis of Algorithms and Heuristics for Metric Properties of Graphs 920
Michele Borassi, Pierluigi Crescenzi, Luca Trevisan
Find Your Place: Simple Distributed Algorithms for Community Detection 940
Luca Becchetti, Andrea Clementi, Emanuele Natale, Francesco Pasquale, Luca Trevisan
Sorting from Noisier Samples 960
Aviad Rubinstein, Shai Vardi
Sampling on the Sphere by Mutually Orthogonal Subspaces 973
Uri Grupel
Exponential Segregation in a Two-Dimensional Schelling Model with Tolerant Individuals 984
Nicole Immorlica, Robert Kleinbergt, Brendan Lucier, Morteza Zadomighaddam
Tight Bounds for Online TSP on the Line 994
Antje Bjelde, Yann Disser, Jan Hackfeld, Christoph Hansknecht, Maarten Lipmann, Julie Meißner, Kevin Schewior, Miriam Schlöter, Leen Stougie

An Improved Upper Bound for the Universal TSP on the Grid 1006
George Christodoulou, Alkmini Sgouritsa
The (h, k)-Server Problem on Bounded Depth Trees 1022
Nikhil Bansah, Marek Eliáš, Lukasz Jez, Grigorios Koumoutsos
Online Lower Bounds via Duality 1038
Yossi Azar, Ilan Reuven Cohen, Alan Roytman
Polylogarithmic Bounds on the Competitiveness of Min-cost Perfect Matching with Delays 1051
Yossi Azar, Ashish Chiplunkar, Haim Kaplan
A Faster Pseudopolynomial Time Algorithm for Subset Sum 1062
Konstantinos Koiliaris, Chao Xu
A Near-Linear Pseudopolynomial Time Algorithm for Subset Sum 1073
Karl Bringmann
Computing Minimum Cuts in Hypergraphs 1085
Chandra Chekuri, Chao Xu
Random Contractions and Sampling for Hypergraph and Hedge Connectivity 1101
Mohsen Ghaffari, David R. Karger, Debmalya Panigrahi
Sandpile Prediction on a Tree in Near Linear Time 1115
Akshay Ramachandran, Aaron Schild
Explicit Resilient Functions Matching Ajtai-Linial 1132
Raghu Meka
Optimal Induced Universal Graphs for Bounded-degree Graphs 1149
Noga Alon, Rajko Nenadov
Approximation Algorithms for Finding Maximum Induced Expanders 1158
Shayan Oveis Gharan, Alireza Rezaei
Parallel Algorithms and Concentration Bounds for the Lovász Local Lemma Via Witness-DAGs 1170
Bernhard Haeupler, David G. Harris
Deterministic Parallel Algorithms for Fooling Polylogarithmic Juntas and the Lovász Local Lemma 1188
David G. Harris
Online Submodular Maximization with Free Disposal: Randomization Beats ¼ for Partition Matroids 1204
T-H. Hubert Chan, Zhiyi Huang, Shaofeng H.-C Jiang, Ning Kang, Zhihao Gavin Tang
Reordering Buffers with Logarithmic Diameter Dependency for Trees 1224
Matthias Englert, Harald Räcke
O(depth)-Competitive Algorithm for Online Multi-level Aggregation 1235
Niv Buchbinder, Moran Feldman, Joseph Naor, Ohad Talmon
Competitive Analysis of the Top-K Ranking Problem 1245
Xi Chen, Sivakanth Gopi, Jieming Mao, Jon Schneider
Statistical Query Algorithms for Mean Vector Estimation and Stochastic Convex Optimization 1265
Vitaly Feldman, Cristobal Guzmán, Santosh Vempala
Sample-Optimal Density Estimation in Nearly-Linear Time 1278
Jayadev Acharya, Ilias Diakonikolas, Jerry Li, Ludwig Schmidt
On Rationality of Nonnegative Matrix Factorization 1290
Dmitry Chistikov, Stefan Kiefer, Ines Marušic, Mahsa Shirmohammadi, James Worrell
Make Up Your Mind: The Price of Online Queries in Differential Privacy 1306
Mark Bun, Thomas Steinke, Jonathan Ullman
ETH Hardness for Densest-k-Subgraph with Perfect Completeness 1326
Mark Braverman, Young Kun Ko, Aviad Rubinstein, Omri Weinstein
The Rainbow at the End of the Line — A PPAD Formulation of the Colorful Carathéodory Theorem with Applications 1342
Frédéric Meunier, Wolfgang Mulzer, Pauline Sarrabezolles, Yannik Stein
Hardness of Continuous Local Search: Query Complexity and Cryptographic Lower Bounds 1352
Pavel Hubácek, Eylon Yogev

VOLUME 3

LP Relaxations of Some NP-Hard Problems Are as Hard as Any LP 1372
Daniel Pruša, Tomas Werner
Feedback Vertex Set Inspired Kernel for Chordal Vertex Deletion 1383
Akanksha Agrawal, Daniel Lokshtanov, Pranabendu Misra, Saket Saurabh, Meirav Zehavi
Approximation and Kernelization for Chordal Vertex Deletion 1399
Bart M. P. Jansen, Marcin Pilipczuk
Fully Polynomial-time Parameterized Computations for Graphs and Matrices of Low Treewidth 1419
Fedor V. Fomin, Daniel Lokshtanov, Michal Pilipczuk, Saket Saurabh, Marcin Wrochna
Spanning Circuits in Regular Matroids 1433
Fedor V. Fomin, Petr A. Golovach, Daniel Lokshtanov, Saket Saurabh
Algorithmic and Hardness Results for the Hub Labeling Problem 1442
Haris Angelidakis, Yury Makarychev, Vsevolod Oparin
Beyond Highway Dimension: Small Distance Labels Using Tree Skeletons 1462
Adrian Kosowski, Laurent Viennot

(1 + ε)-Approximate f-Sensitive Distance Oracles 1479
Shiri Chechik, Sarel Cohen, Amos Fiat, Haim Kaplan
On the Insertion Time of Random Walk Cuckoo Hashing 1497
Alan Frieze, Tony Johansson
File Maintenance: When in Doubt, Change the Layout! 1503
Michael A. Bender, Jeremy T. Fineman, Seth Gilbert, Tsvi Kopelowitz, Pablo Montes
Cross-Referenced Dictionaries and the Limits of Write Optimization 1523
Peyman Afshani, Michael A. Bender, Martín Farach-Colton, Jeremy T. Fineman, Mayank Goswami, Meng-Tsung Tsai
Polynomial Kernels and Wideness Properties of Nowhere Dense Graph Classes 1533
Stephan Kreutzer, Roman Rabinovich, Sebastian Siebertz
Partitioning a Graph into Small Pieces with Applications to Path Transversal 1546
Euiwoong Lee
LP-branching Algorithms Based on Biased Graphs 1559
Magnus Wahlström
About the Structure of the Integer Cone and its Application to Bin Packing 1571
Klaus Jansen, Kim-Manuel Klein
Testing for Forbidden Order Patterns in an Array 1582
Ilan Newman, Yuri Rabinovich, Deepak Rajendraprasad, Christian Sohler
Sequential Measurements, Disturbance and Property Testing 1598
Aram W. Harrow, Cedric Yen-Yu Lin, Ashley Montanaro
A Tight Bound for Green's Arithmetic Triangle Removal Lemma in Vector Spaces 1612
Jacob Fox, LászlóMiklós Lovász
Permutation Property Testing under Different Metrics with Low Query Complexity 1618
Jacob Fox, Fan Wei
Online and Random-order Load Balancing Simultaneously 1638
Marco Molinaro
Building a Good Team: Secretary Problems and the Supermodular Degree 1651
Moran Feldman, Rani Izsak
Combinatorial Prophet Inequalities 1671
Aviad Rubinstein, Sahil Singla
Adaptivity Gaps for Stochastic Probing: Submodular and XOS Functions 1688
Anupam Gupta, Viswanath Nagarajan, Sahil Singla
(1 + Ω(1))-Approximation to MAX-CUT Requires Linear Space 1703
Michael Kapralov, Sanjeev Khanna, Madhu Sudan, Ameya Velingker
On Estimating Maximum Matching Size in Graph Streams 1723
Sepehr Assadi, Sanjeev Khanna, Yang Li
Faster Sublinear Algorithms using Conditional Sampling 1743
Themistoklis Gouleakis, Christos Tzamos, Manolis Zampetakis
Input Sparsity Time Low-rank Approximation via Ridge Leverage Score Sampling 1758
Michael B. Cohen, Cameron Musco, Christopher Musco
A Hybrid Sampling Scheme for Triangle Counting 1778
John Kallaugher, Erie Price
An FPTAS for Counting Proper Four-Colorings on Cubic Graphs 1798
Pinyan Lu, Kuan Yang, Chihao Zhang, Minshen Zhu
Random Cluster Dynamics for the Ising Model is Rapidly Mixing 1818
Heng Guo, Mark Jerrum
Approximately Sampling Elements with Fixed Rank in Graded Posets 1828
Prateek Bhakta, Ben Cousins, Matthew Fahrbach, Dana Randall
Random Walks with the Minimum Degree Local Rule Have $O(N^2)$ Cover Time 1839
Roee David, Uriel Feige
Random Walks and Evolving Sets: Faster Convergences and Limitations 1849
Siu On Chan, Tsz Chiu Kwok, Lap Chi Lau
An O(nm) Time Algorithm for Finding the Min Length Directed Cycle in a Graph 1866
James B. Orlin, Antonio Sedeño-Noda
Strong Connectivity in Directed Graphs under Failures, with Applications 1880
Loukas Georgiadis, Giuseppe F. Italiano, Nikos Parotsidis
Faster Algorithms for Computing Maximal 2-Connected Subgraphs in Sparse Directed Graphs 1900
Shiri Chechik, Thomas Dueholm Hansen, Giuseppe F. Italiano, Veronika Loitzenbauer, Nikos Parotsidis
Local Flow Partitioning for Faster Edge Connectivity 1919
Monika Henzinger, Satish Rao, Di Wang
Doubly Balanced Connected Graph Partitioning 1939
Saleh Soltan, Mihalis Yannakakis, Gil Zussman
Three Colors Suffice: Conflict-Free Coloring of Planar Graphs 1951
Zachary Abel, Victor Alvarez, Erik D. Demaine, Sándor P. Fekete, Aman Gour, Adam Hesterberg, Phillip Keldenich, Christian Scheffer
LP-Based Robust Algorithms for Noisy Minor-Free and Bounded Treewidth Graphs 1964
Nikhil Bansal, Daniel Reichman, Seeun William Umboh
LR-Drawings of Ordered Rooted Binary Trees and Near-Linear Area Drawings of Outerplanar Graphs 1980
Fabrizio Frati, Maurizio Patrignani, Vincenzo Roselli

Partial and Constrained Level Planarity 2000
Guido Brückner, Ignaz Rutter
Accurate and Nearly Optimal Sublinear Approximations to Ulam Distance 2012
Timothy Naumovitz, Michael Saks, C. Seshadhri
A Framework for Analyzing Resparsification Algorithms 2032
Rasmus Kyng, Jakub Pachocki, Richard Peng, Sushant Sachdeva
Adaptive Matrix Vector Product 2044
Santosh S. Vempala, David P. Woodruff

VOLUME 4

Low-Rank PSD Approximation in Input-Sparsity Time 2061
Kenneth L. Clarkson, David P. Woodruff
Locally Testable and Locally Correctable Codes Approaching the Gilbert-Varshamov Bound 2073
Sivakanth Gopi, Swastik Kopparty, Rafael Oliveira, Noga Ron-Zewi, Shubhangi Saraf
Maximally Recoverable Codes for Grid-like Topologies 2092
Parikshit Gopalan, Guangda Hu, Swastik Kopparty, Shubhangi Saraf, Carol Wang, Sergey Yekhanin
MDS Code Constructions with Small Sub-packetization and Near-optimal Repair Bandwidth 2109
Venkatesan Guruswami, Ankit Singh Rawat
Bridging the Capacity Gap Between Interactive and One-Way Communication 2123
Bernhard Haeupler, Ameya Velingker
Subquadratic Algorithms for the Diameter and the Sum of Pairwise Distances in Planar Graphs 2143
Sergio Cabello
A $(2+\varepsilon)$-Approximation for Maximum Weight Matching in the Semi-Streaming Model 2153
Ami Paz, Gregory Schwartzman
Completeness for First-Order Properties on Sparse Structures with Algorithmic Applications 2162
Jiawei Gao, Russell Impagliazzo, Antonina Kolokolova, Ryan Williams
Faster Online Matrix-Vector Multiplication 2182
Kasper Green Larsen, Ryan Williams
Beating Brute Force for Systems of Polynomial Equations over Finite Fields 2190
Daniel Lokshtanov, Ramamohan Paturi, Suguru Tamaki, Ryan Williams, Huacheng Yu
The Complexity of Simulation and Matrix Multiplication 2203
Massimo Cairo, Romeo Rizzi
Better Approximations for Tree Sparsity in Nearly-Linear Time 2215
Arturs Backurs, Piotr Indyk, Ludwig Schmidt
Counting Matchings in Irregular Bipartite Graphs and Random Lifts 2230
M. Lelarge
A Constant-time Algorithm for Middle Levels Gray Codes 2238
Torsten Mütze, Jerri Nummenpalo
On Max-Clique for Intersection Graphs of Sets and the Hadwiger-Debrunner Numbers 2254
Chaya Keller, Shakhar Smorodinsky, Gábor Tardos
Core Congestion is Inherent in Hyperbolic Networks 2264
Victor Chepoi, Feodor F. Dragan, Yann Vaxés
Better Upper Bounds on the Füredi-Hajnal Limits of Permutations 2280
Josef Cibulka, Jan Kyncl
Popularity, Mixed Matchings, and Self-duality 2294
Chien-Chung Huang, Telikepalli Kavitha
Constant Approximation Algorithm for Non-Uniform Capacitated Multi-Item Lot-Sizing via Strong Covering Inequalities 2311
Shi Li
Small Extended Formulation for Knapsack Cover Inequalities from Monotone Circuits 2326
Abbas Bazzi, Samuel Fiorini, Sangxia Huang, Ola Svensson
Extension Complexity Lower Bounds for Mixed-Integer Extended Formulations 2342
Robert Hildebrand, Robert Weismantel, Rico Zenklusen
Opting Into Optimal Matchings 2351
Avrim Blum, Ioannis Caragiannis, Nika Haghtalab, Ariel D. Procaccia, Eviatar B. Procaccia, Rohit Vaish
Firefighting on Trees Beyond Integrality Gaps 2364
David Adjiashvili, Andrea Baggio, Rico Zenklusen
Beating Approximation Factor Two for Weighted Tree Augmentation with Bounded Costs 2384
David Adjiashvili
Simplex Transformations and the Multiway Cut Problem 2400
Niv Buchbinder, Roy Schwartz, Baruch Weizman
To Augment or Not to Augment: Solving Unsplittable Flow on a Path by Creating Slack 2411
Fabrizio Grandoni, Tobias Mömke, Andreas Wiese, Hang Zhou
Optimization of Bootstrapping in Circuits 2423
Fabrice Benhamouda, Tancrède Lepoint, Claire Mathieu, Hang Zhou
Geodesic Spanners for Points on a Polyhedral Terrain 2434
Mohammad Ali Abam, Mark de Berg, Mohammad Javad Rezaei Seraji

Computing the Fréchet Distance between Real-Valued Surfaces 2443
Kevin Buchin, Tim Ophelders, Bettina Speckmann
Incidences with Curves and Surfaces in Three Dimensions, with Applications to Distinct and Repeated Distances 2456
Micha Sharir, Noam Solomon
Eliminating Depth Cycles Among Triangles in Three Dimensions 2476
Boris Aronov, Edward Y. Miller, Micha Sharir
Dynamic Planar Voronoi Diagrams for General Distance Functions and their Algorithmic Applications 2495
Haim Kaplan, Wolfgang Mulzer, Liam Roditty, Paul Seiferth, Micha Sharir
Distributed Degree Splitting, Edge Coloring, and Orientations 2505
Mohsen Ghaffari, Hsin-Hao Su
Tight Network Topology Dependent Bounds on Rounds of Communication 2524
Arkadev Chattopadhyay, Michael Langberg, Shi Li, Atri Rudra
Minimizing Message Size in Stochastic Communication Patterns: Fast Self-Stabilizing Protocols with 3 bits 2540
Lucas Boczkowski, Amos Korman, Emanuele Natale
Time-Space Trade-offs in Population Protocols 2560
Dan Alistarh, James Aspnes, David Eisenstat, Rati Gelashvili, Ronald L. Rivest
Fair Coin Flipping: Tighter Analysis and the Many-Party Case 2580
Niv Buchbinder, Iftach Haitner, Nissan Levi, Eliad Tsfadia
Fair Scheduling via Iterative Quasi-Uniform Sampling 2601
Sungjin Im, Benjamin Moseley
A Logarithmic Additive Integrality Gap for Bin Packing 2616
Rebecca Hoberg, Thomas Rothvoss
Tight Algorithms for Vertex Cover with Hard Capacities on Multigraphs and Hypergraphs 2626
Sam Chiu-wai Wong
Iterative Partial Rounding for Vertex Cover with Hard Capacities 2638
Mong-Jen Kao
Unrelated Machine Scheduling of Jobs with Uniform Smith Ratios 2654
Christos Kalaitzis, Ola Svensson, Jakub Tarnawski
On the Configuration-LP of the Restricted Assignment Problem 2670
Klaus Jansen, Lars Rohwedder
When and Why the Topological Coverage Criterion Works 2679
Nicholas J. Cavanna, Kirk P. Gardner, Donald R. Sheehy
Deciding Contractibility of a Non-Simple Curve on the Boundary of a 3-Manifold 2691
Éric Colin de Verdière, Salman Parsa
An Efficient Representation for Filtrations of Simplicial Complexes 2705
Jean-Daniel Boissonnat, C. S. Karthik
A Polynomial Time Algorithm to Compute Quantum Invariants of 3-manifolds with Bounded First Betti Number. 2721
Clément Maria, Jonathan Spreer
Parameter-free Topology Inference and Sparsification for Data on Manifolds 2733
Tamal K. Dey, Zhe Dong, Yusu Wang
Author Index