# SODA17 – List of Accepted Papers

Paper titles and author information appears as submitted to Easy Chair.

**Paper title and author changes will not be made to this document.**
**The online program will reflect the most up-to-date presentation details, and is scheduled for posting in November** (http://www.siam.org/meetings/da17/program.php).

Minimum Fill-In: Inapproximability and Almost Tight Lower Bounds
Yixin Cao and R. B. Sandeep

An O(nm) time algorithm for finding the min length directed cycle in a weighted graph
James Orlin

Random cluster dynamics for the Ising model is rapidly mixing
Heng Guo and Mark Jerrum

A constant-time algorithm for middle levels Gray codes
Jerri Nummenpalo and Torsten Mütze

Maximum Scatter TSP in Doubling Metrics
László Kozma and Tobias Mömke

Improved bounds and parallel algorithms for the Lovasz Local Lemma
David Harris and Bernhard Haeupler

Deterministic parallel algorithms for fooling polylogarithmic juntas and the Lov\'{a}sz Local Lemma
David Harris

A Logarithmic Additive Integrality Gap for Bin Packing
Rebecca Hoberg and Thomas Rothvoss

Firefighting on Trees Beyond Integrality Gaps
David Adjiashvili, Andrea Baggio and Rico Zenklusen

Three Colors Suffice: Conflict-Free Coloring of Planar Graphs
Zachary Abel, Victor Alvarez, Erik D. Demaine, Sándor Fekete, Aman Gour, Adam Hesterberg, Phillip Keldenich and Christian Scheffer

Counting matchings in irregular bipartite graphs and random lifts
Marc Lelarge

Geodesic Spanners for Points on a Polyhedral Terrain
Mohammad Ali Abam, Mark de Berg and Mohammad Javad Rezaei seraji

Iterative Partial Rounding for Vertex Cover with Hard Capacities
Mong-Jen Kao

LP Relaxations of Hard Problems Can Be Hard
Daniel Prusa and Tomas Werner

Sample Optimal Density Estimation in Nearly-Linear Time
Jayadev Acharya, Ilias Diakonikolas, Jerry Li and Ludwig Schmidt

Computing Walrasian Equilibria: Fast Algorithms and Structural Properties
Renato Paes Leme and Sam Chiu-Wai Wong

Doubly Balanced Connected Graph Partitioning
Saleh Soltan, Mihalis Yannakakis and Gil Zussman

Faster Online Matrix-Vector Multiplication
Kasper Green Larsen and Ryan Williams

Approximation and Kernelization for Chordal Vertex Deletion
Bart M. P. Jansen and Marcin Pilipczuk

An Efficient Representation for Filtrations of Simplicial Complexes
Jean-Daniel Boissonnat and Karthik C. S.

An Axiomatic and an Average-Case Analysis of Algorithms and Heuristics for Metric Properties of Graphs
Michele Borassi, Pierluigi Crescenzi and Luca Trevisan

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

Improved pseudopolynomial time algorithms for Subset Sum
Karl Bringmann

Competitive analysis of the top-K ranking problem
Xi Chen, Sivakanth Gopi, Jieming Mao and Jon Schneider

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

Complexity of Simulation Games and Matrix Multiplication
Massimo Cairo and Romeo Rizzi

A polynomial time algorithm to compute quantum invariants of 3-manifolds with bounded first Betti number
Clément Maria and Jonathan Spreer

Find Your Place: Simple Distributed Algorithms for Community Detection
Luca Becchetti, Andrea Clementi, Emanuele Natale, Francesco Pasquale and Luca Trevisan

Online Submodular Maximization with Free Disposal: Randomization Beats 1/4 for Partition Matroids
T-H. Hubert Chan, Zhiyi Huang, Shaofeng H.-C. Jiang, Ning Kang and Zhihao Gavin Tang

About the Structure of the Integer Cone and its Application to Bin Packing
Klaus Jansen and Kim-Manuel Klein

Unrelated Machine Scheduling of Jobs with Uniform Smith Ratios
Christos Kalaitzis, Ola Svensson and Jakub Tarnawski

Best-Response Dynamics in Combinatorial Auctions with Item Bidding
Paul Duetting and Thomas Kesselheim

Decidability of the Membership Problem for 2x2 integer matrices
Pavel Semukhin and Igor Potapov

Building a Good Team: Secretary Problems and the Supermodular Degree
Moran Feldman and Rani Izsak

Fair Scheduling via Iterative Quasi-Uniform Sampling
Sungjin Im and Benjamin Moseley

High-dimensional approximate r-nets
Georgia Avarikioti, Ioannis Emiris, Loukas Kavouras and Ioannis Psarros

When and Why the Topological Coverage Criterion Works
Nicholas Cavanna, Kirk Gardner and Don Sheehy

Algorithmic and Hardness Results for the Hub Labeling Problem
Haris Angelidakis, Yury Makarychev and Vsevolod Oparin

A Faster Pseudopolynomial Time Algorithm for Subset Sum
Konstantinos Koiliaris and Chao Xu

Robust approximation algorithms for near-unanimity constraints
Victor Dalmau, Marcin Kozik, Andrei Krokhin, Konstantin Makarychev, Yury Makarychev and Jakub Oprsal

Simplex Transformations and the Multiway Cut Problem
Niv Buchbinder, Roy Schwartz and Baruch Weizman

Opting Into Optimal Matchings
Avrim Blum, Ioannis Caragiannis, Nika Haghtalab, Ariel Procaccia, Eviatar Procaccia and Rohit Vaish

(1+\epsilon)-Approximate f-Sensitive Distance Oracles
Shiri Chechik, Sarel Cohen, Amos Fiat and Haim Kaplan

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

Locally-correctable and locally-testable codes approaching the Gilbert-Varshamov bound
Sivakanth Gopi, Swastik Kopparty, Rafael Oliveira, Noga Ron-Zewi and Shubhangi Saraf

Convergence of lookahead price-update dynamics in Fisher Markets
Krishnamurthy Dvijotham, Yuval Ravani and Leonard Schulman

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

FPTAS for Counting Proper Four Colorings on Cubic Graphs
Pinyan Lu, Kuan Yang, Chihao Zhang and Minshen Zhu

On Max-Clique for intersection graphs of sets and the Hadwiger-Debrunner numbers
Chaya Keller, Shakhar Smorodinsky and Gabor Tardos

On the Configuration-LP of the Restricted Assignment Problem
Klaus Jansen and Lars Rohwedder

Sequential measurements, disturbance and property testing
Aram Harrow, Cedric Lin and Ashley Montanaro

Spanning  Circuits in Regular Matroids
Fedor Fomin, Petr Golovach, Daniel Lokshtanov and Saket Saurabh

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

Efficient Algorithms for Constructing Very Sparse Spanners and Emulators
Michael Elkin and Ofer Neiman

To Augment or Not to Augment: Solving Unsplittable Flow on a Path by Creating Slack
Fabrizio Grandoni, Tobias Mömke, Andreas Wiese and Hang Zhou

Core congestion is inherent in hyperbolic networks
Victor Chepoi, Feodor F. Dragan and Yann Vaxès

Sampling on the Sphere by Mutually Orthogonal Subspaces
Uri Grupel

Popularity, Mixed Matchings, and Self-Duality
Chien-Chung Huang and Telikepalli Kavitha

Subquadratic Algorithms for the Diameter and the Sum of Pairwise Distances in Planar Graphs
Sergio Cabello

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

Improved Reordering Buffer Management for Trees and General Metrics
Matthias Englert and Harald Räcke

Sorting from Noisier Samples
Aviad Rubinstein and Shai Vardi

Distributed Degree Splitting, Edge Coloring, and Orientations
Mohsen Ghaffari and Hsin-Hao Su

Explicit resilient functions matching Ajtai-Linial
Raghu Meka

Fully polynomial-time parameterized computations for graphs and matrices of low treewidth
Fedor Fomin, Daniel Lokshtanov, Michał Pilipczuk, Saket Saurabh and Marcin Wrochna

Scaling Algorithms for Weighted Matching in General Graphs
Ran Duan, Seth Pettie and Hsin-Hao Su

A $(2+\epsilon)$-Approximation for Maximum Weight Matching in the Semi-Streaming Model
Ami Paz and Gregory Schwartzman

Optimization of Bootstrapping in Circuits
Fabrice Benhamouda, Tancrède Lepoint, Claire Mathieu and Hang Zhou

Tight Network Topology Dependent Bounds on Rounds of Communication
Arkadev Chattopadhyay, Michael Langberg, Shi Li and Atri Rudra

Tight Algorithms for Vertex Cover with Hard Capacities on Multigraphs and Hypergraphs
Sam Chiu-Wai Wong

Computing the Fréchet Distance between Real-Valued Surfaces
Kevin Buchin, Tim Ophelders and Bettina Speckmann

Random Contractions and Sampling for Hypergraph and Hedge Connectivity
Mohsen Ghaffari, David Karger and Debmalya Panigrahi

Extension Complexity Lower Bounds for Mixed-Integer Extended Formulations
Robert Hildebrand, Robert Weismantel and Rico Zenklusen

Polylogarithmic Bounds on the Competitiveness of Min-cost Perfect Matching with Delays
Yossi Azar, Ashish Chiplunkar and Haim Kaplan

Parameter-free Topology Inference and Sparsification for Data on Manifolds
Tamal Dey, Zhe Dong and Yusu Wang

LP-Based Robust Algorithms for Noisy Minor-Free and Bounded Treewidth Graphs
Nikhil Bansal, Daniel Reichman and Seeun William Umboh

Combinatorial Prophet Inequalities
Sahil Singla and Aviad Rubinstein

Fully dynamic all-pairs shortest paths with worst-case update-time revisited
Ittai Abraham, Shiri Chechik and Sebastian Krinninger

Approximating Spanners and Directed Steiner Forest: Upper and Lower Bounds
Eden Chlamtac, Michael Dinitz, Guy Kortsarz and Bundit Laekhanukit

Adaptivity Gaps for Stochastic Probing: Submodular and XOS Functions
Anupam Gupta, Viswanath Nagarajan and Sahil Singla

Fair Coin Flipping: Tighter Analysis and the Many-Party Case
Nissan Levi, Iftach Haitner, Niv Buchbinder and Eliad Tsfadia

Partitioning a Graph into Small Pieces with Applications to Path Transversal
Euiwoong Lee

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

Online Lower Bounds via Duality
Yossi Azar, Ilan Cohen and Alan Roytman

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

A Treehouse with Custom Windows: Minimum Distortion Embeddings into Bounded Treewidth Graphs
Amir Nayyeri and Benjamin Raichel

Computing minimum cuts in hypergraphs
Chandra Chekuri and Chao Xu

Better Approximations for Tree Sparsity in Nearly Linear Time
Arturs Backurs, Piotr Indyk and Ludwig Schmidt

Probabilistic clustering of high dimensional norms
Assaf Naor

Small-Area Drawings of Outerplanar Graphs via LR-Algorithms for Ordered Rooted Binary Trees
Fabrizio Frati, Maurizio Patrignani and Vincenzo Roselli

MDS code constructions with small sub-packetization and near-optimal repair bandwidth
Venkatesan Guruswami and Ankit Singh Rawat

Completeness and improved algorithms for first-order properties on sparse structures
Jiawei Gao, Russell Impagliazzo, Antonina Kolokolova and Ryan Williams

Random walks with the minimum degree local rule have O(n2) cover time
Roee David and Uriel Feige

The (h,k) server problem on bounded-depth trees
Nikhil Bansal, Marek Elias, Lukasz Jez and Grigorios Koumoutsos

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

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

Faster Sublinear Algorithms via Conditional Sampling
Themis Gouleakis, Christos Tzamos and Emmanouil Zampetakis

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

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

Fast Permutation Property Testing
Fan Wei and Jacob Fox

Improved graph sampling for triangle counting
John Kallaugher and Eric Price

Adaptive Matrix Vector Product
Santosh Vempala and David P. Woodruff

A tight bound for Green's arithmetic triangle removal lemma in vector spaces
Jacob Fox and László Miklós Lovász

Local Flow Partitioning for Faster Edge Connectivity
Monika Henzinger, Satish Rao and Di Wang

Metric embeddings with outliers
Anastasios Sidiropoulos, Dingkang Wang and Yusu Wang

Beating Brute Force for Systems of Polynomial Equations over Finite Fields
Daniel Lokshtanov, Ramamohan Paturi, Suguru Tamaki, Ryan Williams and Huacheng Yu

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

Constant Approximation Algorithm for Non-Uniform Capacitated Multi-Item Lot-Sizing via Strong Covering Inequalities
Shi Li

Linear Size Distance Preservers
Gregory Bodwin

Time-space Trade-offs in Molecular Computation
Dan Alistarh, James Aspnes, David Eisenstat, Rati Gelashvili and Ronald L. Rivest

Incidences with curves and surfaces in three dimensions, with applications to distinct and repeated distances
Micha Sharir and Noam Solomon

Improved Bounds for Online Multi-level Aggregation
Niv Buchbinder, Moran Feldman, Seffi Naor and Ohad Talmon

Bridging the Capacity Gap Between Interactive and One-Way Communication
Bernhard Haeupler and Ameya Velingker

Near-Optimal (Euclidean) Metric Compression
Piotr Indyk and Tal Wagner

Low-Rank PSD Approximation in Input-Sparsity Time
Kenneth Clarkson and David P. Woodruff

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

Minimizing the Union: Tight Approximations for Small Set Bipartite Vertex Expansion
Eden Chlamtac, Michael Dinitz and Yury Makarychev

Small Extended Formulation for Knapsack Cover Inequalities from Monotone Circuits
Abbas Bazzi, Samuel Fiorini, Sangxia Huang and Ola Svensson

Sandpile prediction on a tree in near linear time
Akshay Ramachandran and Aaron Schild

Optimal induced universal graphs for bounded-degree graphs
Noga Alon and Rajko Nenadov

Tight Bounds for Online TSP on the Line
Antje Bjelde, Yann Disser, Jan Hackfeld, Christoph Hansknecht, Maarten Lipmann, Julie Meißner, Kevin Schewior, Miriam Schlöter and Leen Stougie

Hardness of Continuous Local Search: Query Complexity and Cryptographic Lower Bounds
Pavel Hubacek and Eylon Yogev

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

Deciding Contractibility of a Non-Simple Curve on the Boundary of a 3-Manifold
Éric Colin de Verdière and Salman Parsa

Near-Linear Time Approximation Schemes for Some Implicit Fractional Packing Problems
Chandra Chekuri and Kent Quanrud

Approximate Hierarchical Clustering via Sparsest Cut and Spreading Metrics
Vaggos Chatziafratis and Moses Charikar

Eliminating depth cycles among triangles in three dimensions
Boris Aronov, Micha Sharir and Edward Miller

Dynamic Planar Voronoi Diagrams for General Distance Functions and their Algorithmic Applications
Haim Kaplan, Wolfgang Mulzer, Liam Roditty, Paul Seiferth and Micha Sharir

The Rainbow at the End of the Line --- A PPAD Formulation of the Colorful Caratheodory Theorem with Applications
Frédéric Meunier, Wolfgang Mulzer, Pauline Sarrabezolles and Yannik Stein

Faster approximation schemes for the two-dimensional knapsack problem
Sandy Heydrich and Andreas Wiese

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

Optimal Approximate Polytope Membership
Sunil Arya, Guilherme D. Da Fonseca and David Mount

Polynomial Kernels and Wideness Properties of Nowhere Dense Graph Classes
Stephan Kreutzer, Roman Rabinovich and Sebastian Siebertz

Online and Random-order Load Balancing Simultaneously
Marco Molinaro

The Identity Problem for Matrix Semigroups in SL(2,Z) is NP-complete
Paul Bell, Mika Hirvensalo and Igor Potapov

ETH Hardness for Densest-$k$-Subgraph with Perfect Completeness
Mark Braverman, Young Kun Ko, Aviad Rubinstein and Omri Weinstein

Furedi-Hajnal limits are typically subexponential
Josef Cibulka and Jan Kynčl

Fully Dynamic Connectivity in O(log n (log log n)^2) Amortized Expected Time
Shang-En Huang, Dawei Huang, Tsvi Kopelowitz and Seth Pettie

A Hierarchy of Lower Bounds for Sublinear Additive Spanners
Amir Abboud, Greg Bodwin and Seth Pettie

On Rationality of Nonnegative Matrix Factorization
Dmitry Chistikov, Stefan Kiefer, Ines Marusic, Mahsa Shirmohammadi and James Worrell

Fast and Memory-Efficient Algorithms for Evacuation Problems
Miriam Schlöter and Martin Skutella

Parameter-free Locality Sensitive Hashing for Spherical Range Reporting
Thomas Dybdahl Ahle, Martin Aumüller and Rasmus Pagh

On the insertion time of random walk cuckoo hashing
Alan Frieze and Tony Johansson

Beyond Metric Embedding: Approximating Group Steiner Trees on Bounded Treewidth Graphs
Parinya Chalermsook, Syamantak Das, Bundit Laekhanukit and Daniel Vaz

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

Approximation Algorithms for Label Cover and The Log-Density Threshold
Eden Chlamtac, Pasin Manurangsi, Dana Moshkovitz and Aravindan Vijayaraghavan

Exponential Segregation in a Two-Dimensional Schelling Model with Tolerant Individuals
Nicole Immorlica, Bobby Kleinberg, Brendan Lucier and Morteza Zadomighaddam

Strong Connectivity in Directed Graphs under Failures
Loukas Georgiadis, Giuseppe F. Italiano and Nikos Parotsidis

Input Sparsity Time Low-Rank Approximation via Ridge Leverage Score Sampling
Michael B. Cohen, Cameron Musco and Christopher Musco

LP-branching algorithms based on biased graphs
Magnus Wahlström

On Estimating Maximum Matching Size in Graph Streams
Sepehr Assadi, Sanjeev Khanna and Yang Li

Hardness of Permutation Pattern Matching
Vít Jelínek and Jan Kynčl

Minimizing Message Size in Stochastic Communication Patterns: Fast Self-Stabilizing Protocols with 3 bits
Lucas Boczkowski, Amos Korman and Emanuele Natale

Totally Unimodular Congestion Games
Alberto Del Pia, Michael Ferris and Carla Michini

Feedback Vertex Set Inspired Kernel for Chordal Vertex Deletion
Akanksha Agrawal, Pranabendu Misra, Saket Saurabh, Meirav Zehavi and Daniel Lokshtanov

Testing for Forbidden Order Patterns in an Array
Ilan Newman, Yuri Rabinovich, Deepak Rajendraprasad and Christian Sohler

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

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

Beyond Highway Dimension: Small Distance Labels Using Tree Skeletons
Adrian Kosowski and Laurent Viennot

Faster Algorithms for Computing Maximal 2-Connected Subgraphs in Sparse Directed Graphs
Shiri Chechik, Thomas Dueholm Hansen, Giuseppe F. Italiano, Veronika Loitzenbauer and Nikos Parotsidis

Random Walks and Evolving Sets: Faster Convergences and Limitations
Siu On Chan, Tsz Chiu Kwok and Lap Chi Lau

Improved Approximation for Weighted Tree Augmentation with Bounded Costs
David Adjiashvili

Approximation Algorithms for Finding Maximum Induced Expanders
Shayan Oveis Gharan and Alireza Rezaei

Statistical Query Algorithms for Mean Vector Estimation and Stochastic Convex Optimization
Vitaly Feldman, Cristobal Guzman and Santosh Vempala

$(1+\Omega(1))$-Approximation to MAX-CUT Requires Linear Space
Michael Kapralov, Sanjeev Khanna, Madhu Sudan and Ameya Velingker

LAST but not Least: Buy-at-Bulk via Online Spanners
Anupam Gupta, R Ravi, Kunal Talwar and Seeun Umboh

Playing Anonymous Games using Simple Strategies
Yu Cheng, Ilias Diakonikolas and Alistair Stewart

Accurate and Nearly Optimal Sublinear Approximations to Ulam Distance
Timothy Naumovitz, Michael Saks and C. Seshadhri

Matrix Balancing in Lp Norms: Bounding the Convergence rate of Osborne's Iteration
Arman Yousefi, Rafail Ostrovsky and Yuval Rabani

An Improved Upper Bound for the Universal TSP on the Grid
George Christodoulou and Alkmini Sgouritsa

File Maintenance: When in Doubt, Change the Layout!
Michael Bender, Jeremy Fineman, Seth Gilbert, Tsvi Kopelowitz and Pablo Montes

Maximally Recoverable Codes for Grid-like Topologies
Parikshit Gopalan, Guanda Hu, Swastik Kopparty, Shubhangi Saraf, Carol Wang and Sergey Yekhanin

Cross-Referenced Dictionaries and the Limits of Write Optimization
Peyman Afshani, Michael A. Bender, Martin Farach-Colton, Jeremy T. Fineman, Mayank Goswami and Meng-Tsung Tsai

A framework for analyzing resparsification algorithms
Rasmus Kyng, Jakub Pachocki, Richard Peng and Sushant Sachdeva

Generalized Preconditioning and Undirected Minimum-Cost Flow
Jonah Sherman

Approximating Multicut and the demand graph
Chandra Chekuri and Vivek Madan

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

Negative-Weight Shortest Paths and Unit Capacity Minimum Cost Flow in O~(m^{10/7} log W) Time
Michael B. Cohen, Aleksander Madry, Piotr Sankowski and Adrian Vladu

Make Up Your Mind: The Price of Online Queries in Differential Privacy
Mark Bun, Thomas Steinke and Jonathan Ullman

Partial and Constrained Level Planarity
Guido Brückner and Ignaz Rutter

Approximately Sampling Elements with Fixed Rank in Graded Posets
Prateek Bhakta, Ben Cousins, Matthew Fahrbach and Dana Randall