FOCS 2018

59th Annual IEEE Symposium on Foundations of Computer Science

7-9 October 2018 • Paris, France

Pdf-version for printing

Saturday, October 6

8:30-18:00	**Workshops/Tutorials**
19:30-21:30	**Reception** At the "patio" of the Jussieu campus, 4 place Jussieu 75005 Paris

Main Program

(Links to papers will be added later)

A-sessions and plenary sessions are held in the Lavoisier amphitheater.
B-sessions are held in Hall 101.

Sunday, October 7

	Session 1.1.A chaired by Piotr Sankowski	Session 1.1.B chaired by Gregory Valiant
09:00-09:20	**Balancing Vectors in Any Norms** *Daniel Dadush (CWI); Aleksandar Nikolov (University of Toronto); Kunal Talwar (Google Brain); Nicole Tomczak-Jaegermann (University of Alberta)*	**A Short List of Equalities Induces Large Sign Rank** *Arkadev Chattopadhyay, Nikhil Mande (TIFR, Mumbai)*
09:25-09:45	**Metric Sublinear Algorithms via Linear Sampling.** *Hossein Esfandiari, Michael Mitzenmacher (Harvard SEAS)*	**Simple Optimal Hitting Sets for Small-Success RL** *William M. Hoza, David Zuckerman (University of Texas at Austin)*
09:50-10:10	**Approximating the Permanent of a Random Matrix with Vanishing Mean** *Lior Eldar; Saeed Mehraban (MIT)*	**Hardness Magnification for Natural Problems** *Igor Carboni Oliveira, Rahul Santhanam (University of Oxford)*
10:15-10:35	**Log-Concave Polynomials, Entropy, and a Deterministic Approximation Algorithm for Counting Bases of Matroids** *Nima Anari (Stanford University); Shayan Oveis Gharan (University of Washington); Cynthia Vinzant (North Carolina State University)*	**Counting t-cliques: Worst-Case to Average-Case Reductions and Direct Interactive Proof Systems** *Oded Goldreich, Guy N. Rothblum (Weizmann Institute of Science)*
10:35-10:55	Coffee Break	
	Session 1.2.A chaired by Piotr Sankowski	Session 1.2.B chaired by Gregory Valiant
10:55-11:15	**A Faster Isomorphism Test for Graphs of Small Degree** *Martin Grohe, Daniel Neuen (RWTH Aachen University); Pascal Schweitzer (TU Kaiserslautern)*	**Delegating Computations with (almost) Minimal Time and Space Overhead** *Justin Holmgren (MIT); Ron D. Rothblum (MIT and Northeastern University)*
11:20-11:40	**Graph Sketching Against Adaptive Adversaries Applied to the Minimum Degree Algorithm** *Matthew Fahrbach (Georgia Tech); Gary L. Miller (Carnegie Mellon University); Richard Peng, Saurabh Sawlani (Georgia Tech); Junxing Wang (Carnegie Mellon University); Shen Chen Xu (Facebook)*	**Computational Two-Party Correlation: A Dichotomy for Key-Agreement Protocols** *Iftach Haitner (Tel Aviv University); Ronen Shaltiel, Jad Silbak (University of Haifa); Kobbi Nissim (Georgetown University); Eran Omri (Ariel University)*
11:45-12:05	**Faster Exact and Approximate Algorithms for *k*-Cut** *Anupam Gupta (Carnegie Mellon University); Euiwoong Lee (New York University); Jason Li (Carnegie Mellon University)*	**PPP-Completeness with Connections to Cryptography** *Katerina Sotiraki, Manolis Zampetakis (MIT); Giorgos Zirdelis (Northeastern University)*
12:05-14:00	Lunch	
	Session 1.3.A chaired by Vincent Cohen-Addad	Session 1.3.B chaired by Nikhil Bansal
14:00-14:20	**Holder Homeomorphisms and Approximate Nearest Neighbors** *Alexandr Andoni (Columbia University); Assaf Naor (Princeton University); Aleksandar Nikolov (University of Toronto); Ilya Razenshteyn (Microsoft Research Redmond); Erik Waingarten (Columbia University)*	**MDS matrices over small fields: A proof of the GM-MDS conjecture** *Shachar Lovett (UC San Diego)*
14:25-14:45	**Near-Optimal Approximate Decremental All Pairs Shortest Paths** *Shiri Chechik (Tel-Aviv University)*	**Deterministic Document Exchange Protocols, and Almost Optimal Binary Codes for Edit Errors** *Kuan Cheng, Zhengzhong Jin, Xin Li, Ke Wu (Johns Hopkins University)*
14:50-15:10	**Bloom Filters, Adaptivity, and the Dictionary Problem** *Michael A. Bender (Stony Brook University); Martin Farach-Colton (Rutgers University); Mayank Goswami (Queens College, CUNY); Rob Johnson (VMware Research); Samuel McCauley (BARC and IT U. Copenhagen); Shikha Singh (Stony Brook University)*	**Improved decoding of Folded Reed-Solomon and Multiplicity Codes** *Swastik Kopparty (Rutgers University); Noga Ron-Zewi (Haifa University); Shubhangi Saraf (Rutgers University); Mary Wootters (Stanford University)*
15:10-15:30	Coffee Break	
	Session 1.4.A chaired by Amir Abboud	Session 1.4.B chaired by Nisheeth Vishnoi
15:30-15:50	**An Improved Bound for Weak Epsilon-Nets in the Plane** *Natan Rubin (Ben-Gurion University of The Negev)*	**The complexity of general-valued CSPs seen from the other side** *Clement Carbonnel, Miguel Romero, Stanislav Zivny (University of Oxford)*
	Session 1.5 chaired by Mikkel Thorup	
15:55-16:15	**Non-black-box Worst-case to Average-case Reductions within NP** (best student paper) *Shuichi Hirahara (The University of Tokyo)*	
16:20-16:40	**Classical Verification of Quantum Computations** (best student paper and best paper) *Urmila Mahadev (UC Berkeley)*	
	Hall 101	
16:45-18:45	**Business Meeting**	

Monday, October 8

	Session 2.1.A chaired by Amir Abboud	Session 2.1.B chaired by Nikhil Bansal
09:00-09:20	**Contextual Search via Intrinsic Volumes** *Renato Paes Leme (Google Research); Jon Schneider (Princeton University)*	**A Cryptographic Test of Quantumness and Certifiable Randomness from a Single Quantum Device** *Zvika Brakerski (Weizmann Institute of Science); Paul Christiano (OpenAI); Urmila Mahadev, Umesh Vazirani (UC Berkeley); Thomas Vidick (California Institute of Technology)*
09:25-09:45	**Towards Learning Sparsely Used Dictionaries with Arbitrary Supports** *Pranjal Awasthi (Rutgers University); Aravindan Vijayaraghavan (Northwestern University)*	**Classical Homomorphic Encryption for Quantum Circuits** *Urmila Mahadev (UC Berkeley)*
09:50-10:10	**Learning Sums of Independent Random Variables with Sparse Collective Support** *Anindya De (Northwestern University); Philip M. Long (Google); Rocco Servedio (Columbia University)*	**Classical lower bounds from quantum upper bounds** *Shalev Ben-David (University of Maryland); Adam Bouland (University of California, Berkeley); Ankit Garg, Robin Kothari (Microsoft Research)*
10:15-10:35	**Recharging Bandits** *Robert Kleinberg (Cornell University); Nicole Immorlica (Microsoft Research)*	**Quantum algorithm for simulating real time evolution of lattice Hamiltonians** *Jeongwan Haah, Matthew B. Hastings, Robin Kothari, Guang Hao Low (Microsoft Research)*
10:35-10:55	Coffee Break	
	Session 2.2.A chaired by Nisheeth Vishnoi	Session 2.2.B chaired by Nikhil Bansal
10:55-11:15	**Graph Sparsification, Spectral Sketches, and Faster Resistance Computation, via Short Cycle Decompositions** *Timothy Chu (Carnegie Mellon); Yu Gao, Richard Peng (Georgia Tech); Sushant Sachdeva (University of Toronto); Saurabh Sawlani (Georgia Tech); Junxing Wang (Carnegie Mellon)*	**Near-Optimal Communication Lower Bounds for Approximate Nash Equilibria** *Mika Goos, Aviad Rubinstein (Harvard)*
11:20-11:40	**A Matrix Chernoff Bound for Strongly Rayleigh Distributions and Spectral Sparsifiers from a few Random Spanning Trees** *Rasmus Kyng (Harvard University); Zhao Song (Harvard University & UT-Austin)*	**An End-to-end Argument in Mechanism Design (Prior-independent Auctions for Budgeted Agents)** *Yiding Feng, Jason D. Hartline (Northwestern University)*
11:45-12:05	**Spectral Subspace Sparsification** *Huan Li (School of Computer Science, Fudan University); Aaron Schild (Electrical Engineering and Computer Science, University of California, Berkeley)*	**The Sample Complexity of Up-to-ε Multi-Dimensional Revenue Maximization** *Yannai A. Gonczarowski (Hebrew University of Jerusalem, Microsoft Research); S. Matthew Weinberg (Princeton University)*
12:05-14:00	Lunch	
	Session 2.3.A chaired by Nisheeth Vishnoi	Session 2.3.B chaired by Amir Abboud
14:00-14:20	**Improved Online Algorithm for Weighted Flow Time** *Yossi Azar, Noam Touitou (Tel Aviv University)*	**Deterministic Factorization of Sparse Polynomials with Bounded Individual Degree** *Vishwas Bhargava, Shubhangi Saraf (Rutgers University); Ilya Volkovich (University of Michigan)*
14:25-14:45	**Fusible HSTs and the randomized k-server conjecture** *James R. Lee (University of Washington)*	**Testing Graph Clusterability: Algorithms and Lower Bounds** *Ashish Chiplunkar, Michael Kapralov (EPFL); Sanjeev Khanna (University of Pennsylvania); Aida Mousavifar (EPFL); Yuval Peres (Microsoft Research Redmond)*
14:50-15:10	**An ETH-Tight Exact Algorithm for Euclidean TSP** *Mark de Berg (Eindhoven University of Technology); Hans L. Bodlaender (Utrecht University and Eindhoven University of Technology); Sandor Kisfaludi-Bak, Sudeshna Kolay (Eindhoven University of Technology)*	**Finding forbidden minors in sublinear time: an $n^{1/2+o(1)}$-query one-sided tester for minor closed properties** *Akash Kumar (Purdue University); C. Seshadhri, Andrew Stolman (University of California, Santa Cruz)*
15:15-15:35	**0/1/all CSPs, Half-Integral A-path Packing, and Linear-Time FPT Algorithms** *Yoichi Iwata (National Institute of Informatics); Yutaro Yamaguchi (Osaka University); Yuichi Yoshida (National Institute of Informatics)*	**Privacy Amplification by Iteration** *Vitaly Feldman, Ilya Mironov, Kunal Talwar (Google); Abhradeep Thakurta (UC Santa Cruz)*
15:40-16:00	**On subexponential parameterized algorithms for Steiner Tree and Directed Subset TSP on planar graphs** *Dániel Marx (Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI), Hungary); Marcin Pilipczuk, Michal Pilipczuk (Institute of Informatics, University of Warsaw, Poland)*	**Revealing network structure, confidentially: Improved Rates for Node-private Graphon Estimation** *Christian Borgs, Jennifer Chayes (Microsoft Research); Adam Smith (Boston University); Ilias Zadik (MIT)*
16:00-16:20	Coffee Break	
	Session 2.4.A chaired by Ola Svensson	Session 2.4.B chaired by Alexandra Kolla
16:20-16:40	**Perfect L_p Sampling in a Data Stream** *Rajesh Jayaram, David P. Woodruff (Carnegie Mellon University)*	**EPTAS for Max Clique on Disks and Unit Balls** *Marthe Bonamy (LaBRI, Universite de Bordeaux); Edouard Bonnet (ENS Lyon, LIP); Nicolas Bousquet (G-SCOP laboratory, Grenoble-INP); Pierre Charbit (Universite Paris Diderot, IRIF); Stephan Thomasse (ENS Lyon, LIP)*
16:45-17:05	**The Sketching Complexity of Graph and Hypergraph Counting** *John Kallaugher (UT Austin); Michael Kapralov (EPFL); Eric Price (UT Austin)*	**Limits on All Known (and Some Unknown) Approaches to Matrix Multiplication** *Josh Alman, Virginia Vassilevska Williams (MIT)*
	Session 2.5 chaired by Mikkel Thorup	
17:10-17:30	**Pseudorandom Sets in Grassmann Graph have Near-Perfect Expansion** (best paper) *Subhash Khot (New York University); Dor Minzer, Muli Safra (Tel-Aviv University)*	
	Session 2.6 chaired by Allan Borodin	
17:35-18:35	**Knuth Prize Lecture: On the difficulty of approximating Boolean Max-CSPs** *Johan Håstad (KTH)*	

Tuesday, October 9, 2018

	Session 3.1.A chaired by Vincent Cohen-Addad	Session 3.1.B chaired by Alexandra Kolla
09:00-09:20	**Dispersion for Data-Driven Algorithm Design, Online Learning, and Private Optimization** *Maria-Florina Balcan, Travis Dick, Ellen Vitercik (Carnegie Mellon University)*	**Planar Graph Perfect Matching is in NC** *Nima Anari (Stanford University); Vijay V. Vazirani (University of California, Irvine)*
09:25-09:45	**Efficient Density Evaluation for Smooth Kernels** *Arturs Backurs (MIT); Moses Charikar (Stanford University); Piotr Indyk (MIT); Paris Siminelakis (Stanford University)*	**On Derandomizing Local Distributed Algorithms** *Mohsen Ghaffari (ETH Zurich); David Harris (University of Maryland); Fabian Kuhn (University of Freiburg)*
09:50-10:10	**Efficiently Learning Mixtures of Mallows Models** *Allen Liu, Ankur Moitra (MIT)*	**Parallel Graph Connectivity in Log Diameter Rounds** *Alexandr Andoni (Columbia University); Zhao Song (Harvard University & UT-Austin); Clifford Stein (Columbia University); Zhengyu Wang (Harvard University); Peilin Zhong (Columbia University)*
10:15-10:35	**Efficient Statistics, in High Dimensions, from Truncated Samples** *Constantinos Daskalakis, Themis Gouleakis (MIT); Christos Tzamos (Microsoft Research); Manolis Zampetakis (MIT)*	**A Faster Distributed Single-Source Shortest Paths Algorithm** *Sebastian Krinninger (University of Salzburg); Danupon Nanongkai (KTH Royal Institute of Technology)*
10:35-10:55	Coffee Break	
	Session 3.2.A chaired by Vincent Cohen-Addad	Session 3.2.B chaired by Alexandra Kolla
10:55-11:15	**1-factorizations of pseudorandom graphs** *Asaf Ferber, Vishesh Jain (MIT)*	**Low-degree testing for quantum states, and a quantum entangled games PCP for QMA** *Anand Natarajan (MIT); Thomas Vidick (Caltech)*
11:20-11:40	**Sublinear algorithms for local graph centrality estimation** *Marco Bressan (Sapienza University of Rome); Enoch Peserico, Luca Pretto (University of Padova)*	**Constant overhead quantum fault tolerance with quantum expander codes** *Omar Fawzi (ENS de Lyon); Antoine Grospellier, Anthony Leverrier (Inria)*
11:45-12:05	**Efficient polynomial-time approximation scheme for the genus of dense graphs** *Yifan Jing, Bojan Mohar (Simon Fraser University)*	**Spatial Isolation Implies Zero Knowledge Even in a Quantum World** *Alessandro Chiesa (UC Berkeley); Michael A. Forbes (University of Illinois at Urbana-Champaign); Tom Gur, Nicholas Spooner (UC Berkeley)*
12:05-14:00	Lunch	
	Session 3.3.A chaired by Ola Svensson	Session 3.3.B chaired by Elette Boyle
14:00-14:20	**Beating the integrality ratio for s-t-tours in graphs** *Vera Traub, Jens Vygen (University of Bonn)*	**Non-Malleable Codes for Small-Depth Circuits** *Marshall Ball (Columbia University); Dana Dachman-Soled (University of Maryland); Siyao Guo (Northeastern University); Tal Malkin (Columbia University); Li-Yang Tan (Stanford University)*
14:25-14:45	**Constant Factor Approximation Algorithm for Weighted Flow Time on a Single Machine in Pseudo-polynomial time** *Jatin Batra, Amit Kumar, Naveen Garg (IIT Delhi)*	**Tighter Bounds on Multi-Party Coin Flipping via Augmented Weak Martingales and Differentially Private Sampling** *Amos Beimel (Ben Gurion University); Iftach Haitner, Nikolaos Makriyannis (Tel Aviv University); Eran Omri (Ariel University)*
14:50-15:10	**Random Order Contention Resolution Schemes** *Marek Adamczyk, Michal Wlodarczyk (University of Warsaw)*	**Cryptographic Hashing from Strong One-Way Functions (Or: One-Way Product Functions and their Applications)** *Justin Holmgren, Alex Lombardi (MIT)*
15:15-15:35	**Strong Coresets for k-Median and Subspace Approximation: Goodbye Dimension** *Christian Sohler (TU Dortmund); David P. Woodruff (CMU)*	**Laconic Function Evaluation and Applications** *Willy Quach (Northeastern University); Hoeteck Wee (CNRS and ENS); Daniel Wichs (Northeastern University)*
15:40-16:00	**ε-Coresets for Clustering (with Outliers) in Doubling Metrics** *Lingxiao Huanjag (École polytechnique federale de Lausanne); Shaofeng H.-C. Jiang (The Weizmann Institute of Science); Jian Li, Xuan Wu (Tsinghua University)*	**PanORAMa: Oblivious RAM with Logarithmic Overhead** *Sarvar Patel (Google); Giuseppe Persiano (Google and University of Salerno); Mariana Raykova (Google and Yale University); Kevin Yeo (Google)*
16:00-16:20	Coffee Break	
	Session 3.4.A chaired by Ola Svensson	Session 3.4.B chaired by Elette Boyle
16:20-16:40	**Efficient algorithms for tensor scaling, quantum marginals, and moment polytopes** *Peter Burgisser (Technische Universitet Berlin); Cole Franks (Rutgers University); Ankit Garg (Microsoft Research New England); Rafael Oliveira (University of Toronto); Michael Walter (QuSoft, Korteweg-de Vries Institute for Mathematics, Institute of Physics, and Institute for Logic, Language and Computation, University of Amsterdam); Avi Wigderson (Institute for Advanced Study, Princeton)*	**A Near-Optimal Depth-Hierarchy Theorem for Small-Depth Multilinear Circuits** *Suryajith Chillara, Christian Engels, Nutan Limaye (Department of CSE, IIT Bombay); Srikanth Srinivasan (Department of Mathematics, IIT Bombay)*
16:45-17:05	**Solving Directed Laplacian Systems in Nearly-Linear Time through Sparse LU Factorizations** *Michael B. Cohen, Jonathan Kelner (MIT); Rasmus Kyng (Yale University); John Peebles (MIT); Richard Peng (Georgia Tech); Anup Rao (Adobe Research); Aaron Sidford (Stanford University)*	**Pseudorandom Generators for Read-Once Branching Programs, in any Order** *Michael A. Forbes, Zander Kelley (University of Illinois at Urbana-Champaign)*
17:10-17:30	**The diameter of the fractional matching polytope and its hardness implications** *Laura Sanita (University of Waterloo)*	**Indistinguishability by adaptive procedures with advice, and lower bounds on hardness amplification proofs** *Aryeh Grinberg, Ronen Shaltiel (University of Haifa); Emanuele Viola (Northeastern University)*
17:35-17:55	**Coordinate Methods for Accelerating ℓ_∞ Regression and Faster Approximate Maximum Flow** *Aaron Sidford, Kevin Tian (Stanford University)*	**Near log-convexity of measured heat in (discrete) time and consequences** *Mert Saglam (University of Washington)*
	Session 3.5 chaired by Mikkel Thorup	
18:00-18:20	**Approximating Edit Distance Within Constant Factor in Truly Sub-Quadratic Time** (best paper) *Diptarka Chakraborty, Debarati Das (Computer Science Institute of Charles University, Prague); Elazar Goldenberg (The Academic College Of Tel Aviv-Yaffo, School of Computer Science, Tel Aviv-Yaffo); Michal Koucky (Computer Science Institute of Charles University, Prague); Michael Saks (Department of Mathematics, Rutgers University, NJ)*	