

Tarun Kathuria

CONTACT INFORMATION

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Berkeley, CA - 94709
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RESEARCH INTERESTS

Iterative methods for Convex and Non-Convex Optimization, Random Matrix Theory, High-Dimensional Probability, Stochastic Processes, Algebraic and Spectral Methods in Combinatorics, Randomized Numerical Linear Algebra and their applications to Machine Learning and Database Theory

EMPLOYMENT

Yale University, New Haven, CT

Summer 2019

Summer Intern

Prof. Daniel Spielman

Microsoft Research India, Bangalore

July 2015 - July 2017

Research Fellow, Algorithms and Theory Group

Mentor: Dr. Amit Deshpande

IBM Research India, Bangalore

Summer 2014

Summer Intern, Data Mining Group

Mentor: Dr. Indrajit Bhattacharya

EDUCATION

University of California, Berkeley

August 2017 - Present

Doctor of Philosophy (Ph.D.)

- Major: Computer Science (Convex Optimization and Graph Algorithms)
- Minor: Mathematics
- Advisor: Prasad Raghavendra

Indian Institute of Technology - Bombay, Mumbai, India

July 2011 - June 2015

Bachelor of Technology (Honors)

- Major: Computer Science & Engineering
- Minor: Applied Statistics and Informatics

PUBLICATIONS

1. Ankit Garg, Tarun Kathuria, Nikhil Srivastava [Scalar Poincare implies Matrix Poincare](#). *Electronic Communications in Probability*(26) 2021
2. Tarun Kathuria [A Potential Reduction Inspired Algorithm for Exact Max Flow in Almost \$O\(m^{4/3}\)\$ Time](#). *61st IEEE Annual Symposium on Foundations of Computer Science*, (**FOCS 2020**),
3. Haotian Jiang, Tarun Kathuria, Yin Tat Lee, Swati Padmanabhan, Zhao Song [A Faster Interior Point Method for Semidefinite Programming](#). *61st IEEE Annual Symposium on Foundations of Computer Science*, (**FOCS 2020**)
4. Yeshwanth Cherpanamjeri, Samuel B. Hopkins, Tarun Kathuria, Prasad Raghavendra, Nilesch Tripura-
neni [Algorithms for heavy-tailed statistics: regression, covariance estimation, and beyond](#). *52nd Annual ACM-SIGACT Symposium on Theory of Computing*, (**STOC 2020**)
5. L. Elisa Celis, Vijay Keswani, Damian Straszak, Amit Deshpande, Tarun Kathuria, Nisheeth K. Vishnoi [Fair and Diverse DPP-based Data Summarization](#). *35th International Conference on Machine Learning (ICML 2018)*
6. L. Elisa Celis, Amit Deshpande, Tarun Kathuria, Damian Straszak, Nisheeth K. Vishnoi [On the Complexity of Constrained Determinantal Point Processes](#). (**APPROX-RANDOM 2017**)
7. Tarun Kathuria, S. Sudarshan. [Efficient and Provable Multi-Query Optimization](#). *Proceedings of the 36th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2017)*
8. Tarun Kathuria, Amit Deshpande, Pushmeet Kohli. [Batched Gaussian Process Bandit Optimization via Determinantal Point Processes](#). *Advances in Neural Information Processing Systems (NIPS 2016)*
9. L. Elisa Celis, Amit Deshpande, Tarun Kathuria, Nisheeth K. Vishnoi. [How to be Fair and Diverse?](#) *3rd Workshop on Fairness, Accountability, and Transparency in Machine Learning (FATML 2016)* (selected for oral presentation)

MANUSCRIPTS

1. Tarun Kathuria. A Constructive Proof of the Matrix Spencer Conjecture. *In Preparation*
2. Tarun Kathuria. Sharper Matrix Concentration and Strong Asymptotic Freeness of Gaussian Random Matrices and the Peterson Thom Conjecture. *In Preparation*
3. Tarun Kathuria, Satyaki Mukherjee, Nikhil Srivastava. [On Concentration Inequalities for Random Matrix Products](#). 2020
4. Tarun Kathuria [A Matrix Bernstein Inequality for Strong Rayleigh Distributions](#). 2020

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|------------------------|--|---|
| EXTERNAL REVIEWER | <i>Conference on Learning Theory (COLT), Neural Information Processing Systems (NIPS), International Conference on Machine Learning (ICML), Symposium on Discrete Algorithms (SODA), Foundations of Computer Science (FOCS), Symposium on Theory of Computing (STOC)</i> | |
| TEACHING EXPERIENCE | Graduate Teaching Assistant, UC Berkeley <i>Course : Optimization Models in Engineering (EECS127/227A)</i> | <i>Fall 2022</i> |
| | Graduate Teaching Assistant, UC Berkeley <i>Course : Efficient Algorithms and Intractable Problems (CS170)</i> | <i>Fall 2018, Spring 2019</i> |
| | Undergraduate Teaching Assistant, IIT Bombay <i>Course : Introduction to Numerical Analysis</i> | <i>Summer 2013, Spring 2014, 2015</i> |
| | Undergraduate Teaching Assistant, IIT Bombay <i>Course : Linear Algebra</i> | <i>Autumn 2014</i> |
| | Undergraduate Teaching Assistant, IIT Bombay <i>Course : Electricity & Magnetism</i> | <i>Autumn 2012</i> |
| TECHNICAL SKILLS | Programming Machine Learning | Python, Julia, C++, Java Numpy, Sklearn, Pytorch |