

# Prayaag Venkat

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## RESEARCH INTERESTS

Theoretical computer science, high-dimensional statistics, probability, differential privacy

## EDUCATION

Harvard University Aug. 2018 - Present

- Ph.D. Computer Science.
- Advisor: Boaz Barak.
- Expected graduation: May 2023

University of Maryland, College Park Aug. 2014 - Dec. 2017

- B.S. Computer Science, B.S. Mathematics.
- Advisors: Andrew Childs, Samir Khuller, David Mount, Penghui Yao.

## PUBLICATIONS

- *Privately Estimating a Gaussian: Efficient, Robust and Optimal*. Daniel Alabi, Pravesh Kothari, Pranay Tankala, Prayaag Venkat, Fred Zhang. STOC 2023. Preprint available at: <https://arxiv.org/abs/2212.08018>.
- *Near-optimal fitting of ellipsoids to random points*. Aaron Potechin, Paxton Turner, Prayaag Venkat, Alex Wein. In submission. Preprint available at: <https://arxiv.org/abs/2208.09493>.
- *Efficient algorithms for certifying lower bounds on the discrepancy of random matrices*. Prayaag Venkat. ITCS 2023. Preprint available at: <https://arxiv.org/abs/2211.07503>.
- *Optimal Regularization Can Mitigate Double Descent*. Preetum Nakkiran, Prayaag Venkat, Sham Kakade, Tengyu Ma. ICLR 2021. Preprint available at: <https://arxiv.org/abs/2003.01897>.
- *A Fast Spectral Algorithm for Mean Estimation with Sub-Gaussian Rates*. Zhixian Lei, Kyle Luh, Prayaag Venkat, Fred Zhang. COLT 2020. Preprint available at: <https://arxiv.org/abs/1908.04468>
- *Select and Permute: An Improved Online Framework for Scheduling to Minimize Weighted Completion Time*. Samir Khuller, Jingling Li, Pascal Sturmfels, Kevin Sun, Prayaag Venkat. LATIN 2018. Preprint available at: <https://arxiv.org/abs/1704.06677>.
- *A Succinct, Dynamic Data Structure for Proximity Queries on Point Sets*. Prayaag Venkat, David M. Mount. CCCG 2014.

## AWARDS

- NSF Graduate Fellowship (2018 - Present)
- Banneker Key Scholarship (2014-2018).
- 2017 Goldwater Scholarship.
- 2016 CRA Undergraduate Research Award, Honorable Mention.

- EXPERIENCE**
- Visiting Graduate Student* Fall 2021  
 Simons Institute, University of California, Berkeley
- Participated in the “Computational Complexity of Statistical Inference” program.
- Visiting Graduate Student* Spring 2021  
 The Statistical and Applied Mathematical Sciences Institute
- Participated in the Program on Combinatorial Probability.
- Visiting Graduate Student* Fall 2020  
 Simons Institute, University of California, Berkeley
- Hosted by Professor Prasad Raghavendra.
  - Participated in the “Probability, Geometry, and Computation in High Dimensions” program.

- PRESENTATIONS**
- “Near-optimal fitting of ellipsoids to random points,” Prayaag Venkat. CMU Theory Lunch. October 2022.
  - “A Fast Spectral Algorithm for Mean Estimation with Sub-Gaussian Rates,” Prayaag Venkat. COLT 2020. July 2020.
  - “A 1D Area Law for Gapped Local Hamiltonians,” Boriana Gjura and Prayaag Venkat. Physics and Computation Seminar. Harvard University. November 2018.
  - “Mean Estimation in High Dimensions,” P. Venkat. Harvard TGINF. October 2018.
  - “On Characterizing the Relationship between Lower Bound Methods in Communication Complexity,” Jiahui Liu and Prayaag Venkat.
    - Joint Center for Quantum Information and Computer Science (QuICS) Special Seminar. University of Maryland, College Park. August 2017.
    - Joint CAAR REU and Salisbury REU Poster Session. University of Maryland, College Park. July 2017.
  - “Online Concurrent Open Shop Scheduling.” Prayaag Venkat. Joint CAAR REU and Salisbury REU Poster Session. University of Maryland, College Park. August 2016.
  - ‘A Succinct, Dynamic Data Structure for Proximity Queries on Point Sets.’ Prayaag Venkat. Canadian Conference on Computational Geometry (CCCG) 2014. Dalhousie University, Halifax, Nova Scotia, Canada. August 2014.

- SERVICE AND TEACHING**
- Teaching assistant*
- CS231 (Quantum Computation and Quantum Complexity), taught by Anurag Anshu in Spring 2022.
  - CS121 (Introduction to Theoretical Computer Science), taught by Boaz Barak in Fall 2019

*Reviewer for STOC 2020, FOCS 2021, FOCS 2022*

- Banneker-Key Peer Mentor* 2016-Present  
 University of Maryland, College Park
- Mentored three computer science freshman Banneker-Key Scholarship recipients on selecting courses, pursuing research and internship opportunities, and preparing for future career endeavors.

- Computer Science Department Tutor* 2016-Present  
 University of Maryland, College Park
- Tutored undergraduate students in algorithms and discrete math courses.