Paxton Turner

Curriculum Vitae

Department of Statistics
Harvard University
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Academic position

2021–2023. **Postdoctoral fellow**, *Harvard University, Department of Statistics*,
Postdoc advisor: Zheng Tracy Ke.

Education

June 2021 **Ph.D. in Mathematics**, *Applied Mathematics Program, Massachusetts Institute of Technology (MIT).*

- Thesis: *Combinatorial methods in statistics*
- Advisor: Philippe Rigollet

May 2015 **B.S. in Mathematics**, *Louisiana State University (LSU).*

Research Interests

High-dimensional statistics, machine learning, algorithms, discrete mathematics

Selected publications

- Paxton Turner, Jingbo Liu, and Philippe Rigollet. A Statistical Perspective on Coreset Density Estimation. *Proc. of 24th International Conference on Artificial Intelligence and Statistics*. (AISTATS 2021).
- Paxton Turner, Raghu Meka, and Philippe Rigollet. Balancing Gaussian Vectors in High Dimension. *Proc. of 33rd Conference on Learning Theory* (COLT 2020).
- Paxton Turner, Jingbo Liu, and Philippe Rigollet. Efficient Interpolation of Density Estimators. *Proc. of 24th International Conference on Artificial Intelligence and Statistics*. (AISTATS 2021).
- Sinho Chewi, Patrik Gerber, Philippe Rigollet, and Paxton Turner†.
Gaussian Discrepancy: a Probabilistic Relaxation of Vector Balancing. *Discrete Applied Mathematics*. 2022.

Preprints and manuscripts

- T. Tony Cai, Zheng Tracy Ke, and Paxton Turner†. K-sample Testing for Equality of Probability Mass Functions in High-dimensional Multinomials. Manuscript.
- Jiashun Jin, Zheng Tracy Ke, Paxton Turner, and Anru Zhang†. Phase Transition for Detecting a Small Community in a Large Network. In submission.
- Near-Optimal Fitting of Ellipsoids to Random Points With Aaron Potechin, Prayaag Venkat, and Alex Wein. In submission.
- Younhun Kim, Elchanan Mossel, Govind Ramnarayan, and Paxton Turner†. Efficient Reconstruction of Stochastic Pedigrees. arXiv Preprint. 2020.

† indicates alphabetical ordering. Titles in blue are hyperlinks to the corresponding paper.

Additional publications

- Paxton Turner and Yuhuai Wu[†]. Ehrhart Theory and Discrete Equidecomposablility of Polygons. *Discrete and Computational Geometry*. 2020.
- Megan Leoni, Gregg Musiker, Seth Neel, and Paxton Turner[†]. Aztec Castles and the dP3 Quiver. *Journal of Physics A: Mathematical and Theoretical*. 2014.

Presentations

Nov. 2022 **Discrete Models and Methods: from Multinomial Testing to Data Compression**, *Stat 300 Seminar*, Harvard University.

Oct. 2022 **Testing Variability of Multinomial Data with Applications to Text Analysis**, *Stanford Statistics Seminar*.

Aug. 2022 **Testing Variability of Multinomial Data with Applications to Text Analysis**, *SNAB 2022*, New York University.

June 2022 **Detecting a Small Community in a Large Network**, *SIAM Discrete Math*, Carnegie Mellon University.

Oct. 2021 **A Statistical Perspective on Coresets**, *Stat 300 Seminar*, Harvard University.

April 2021 **A Statistical Perspective on Coreset Density Estimation**, *AISTATS 2021 (virtual)*.

April 2021 **Efficient Interpolation of Density Estimators** , *AISTATS 2021 (virtual)*.

Dec. 2020 **A Statistical Perspective on Coresets**, *YINS Seminar*, Yale University (virtual).

July 2020 **Balancing Gaussian Vectors in High Dimensions**, *COLT 2020 (virtual)*.

Teaching and mentorship

Fall 2020 **Teaching Assistant**, *Fundamental of Statistics (online)*, MIT Math Department.

Summer 2020 **Teaching Assistant**, *Fundamentals of Statistics (online)*, MIT edX Micromasters.

Spring 2019 **Teaching Assistant**, *Introduction to Probability and Statistics*, MIT Math Department.

Summer, Fall 2018 **Teaching Staff**, *Fundamentals of Statistics (online)*, MIT edX Micromasters.

Spring 2017 **Grader**, *Introduction to Stochastic Processes*, MIT Math Department.

Fall 2017 **Grader**, *Extremal Graph Theory and Additive Combinatorics*, MIT Math Department.

Summer 2017 **Mentor**, *Summer Program for Undergraduate Research (SPUR)*, Student: Alonso Espinosa Dominguez. Project: "On Kakeya-type problems for hyperplanes in $\mathbb{R}^d$".

January 2017 **Mentor**, *MIT Directed Reading Program*, Student: Jessy Lin. Text: *The Probabilistic method* by Noga Alon and Joel Spencer.

Service

Reviewer, *Neurips 2022 (top reviewer), FOCS 2022, AISTATS 2022, ICLR 2022, Neurips 2021 (top reviewer), Theory of Computing Systems, UAI 2021 (top reviewer), AISTATS 2021, ICALP 2020*.

2016–2020 **Organizer**, *MIT Integration Bee*.

2017–2018 **Co-organizer**, *MIT Graduate Student Applied Math Seminar (SPAMS)*.

2016–2017 **Tutor**, *English as a Second Language (ESL) Program for MIT Facilities Department Employees*, Student: Gabriel Castrillon.

Summer 2015, 2016 **Instructor**, *LSU Math Circle*, Enrichment program for mathematically gifted high school students.

Honors and Awards

2017 Levinson Fellow - MIT Math Department

2015 Betti and Robert Giles Senior Mathematics Award

2014 Barry M. Goldwater Scholarship Recipient

2014 LSU College of Science Outstanding Junior

2014 LSU Pasquale Porcelli Senior Scholarship

2011–2015 LSU Chancellor's Alumni Scholarship