

Eren C. Kızıldağ

CONTACT INFORMATION	Department of Statistics Columbia University 1255 Amsterdam Avenue, Room 930, New York, NY 10027 United States	E-mail: eck2170@columbia.edu https://www.eren-kizildag.com
RESEARCH INTERESTS	Applied probability, high-dimensional statistics, machine learning, and theoretical computer science	
EMPLOYMENT	Columbia University Distinguished Postdoctoral Fellow, Department of Statistics (July 2022 - July 2024)	
EDUCATION	Massachusetts Institute of Technology Ph.D. in Electrical Engineering and Computer Science (September 2017 - May 2022) GPA: 5.0/5.0 <ul style="list-style-type: none">• Advisor: Prof. David Gamarnik• Thesis Title: Algorithms and Algorithmic Barriers in High-Dimensional Statistics and Random Combinatorial Structures M.S. in Electrical Engineering and Computer Science (June 2017) GPA: 5.0/5.0 <ul style="list-style-type: none">• Advisor: Prof. Elfar Adalsteinsson• Thesis Title: Improved Magnetic Resonance Chemical Shift Imaging at 3 Tesla using a 32-channel Integrated RF-Shim Coil Array Minor in Mathematics (February 2017)	
	Bogazici University, Turkey B.Sc. in Electrical and Electronics Engineering (June 2014) GPA: 3.99/4.00 <ul style="list-style-type: none">• 2nd rank in the university.• Specialized in Control Theory.	
JOURNAL PUBLICATIONS & PREPRINTS	Algorithmic Obstructions in the Random Number Partitioning Problem David Gamarnik, Eren C. Kızıldağ <i>The Annals of Applied Probability (Major Revisions), 2022+</i>	
	Self-Regularity of Non-Negative Output Weights for Overparameterized Two-Layer Neural Networks David Gamarnik, Eren C. Kızıldağ, Ilias Zadik. <i>IEEE Transactions on Signal Processing, 2022</i>	
	Computing the Partition Function of the Sherrington-Kirkpatrick Model is Hard on Average David Gamarnik and Eren C. Kızıldağ <i>The Annals of Applied Probability, 2021</i>	
	Inference in High-Dimensional Linear Regression via Lattice Basis Reduction and Integer Relation Detection David Gamarnik, Eren C. Kızıldağ, Ilias Zadik. <i>IEEE Transactions on Information Theory, 2021</i>	
	Stationary Points of Shallow Neural Networks with Quadratic Activation Function David Gamarnik, Eren C. Kızıldağ, Ilias Zadik. <i>Submitted to Mathematics of Operations Research, 2022+</i>	

Neural Networks and Polynomial Regression. Demystifying the Overparametrization Phenomena

Matt Emschwiller, David Gamarnik, Eren C. Kızıldağ, Ilias Zadik
Preprint, 2020

CONFERENCE
PAPERS

Algorithms and Barriers in the Symmetric Binary Perceptron Model

David Gamarnik, Eren C. Kızıldağ, Will Perkins, Changji Xu
IEEE Symposium on Foundations of Computer Science (FOCS), 2022

The Random Number Partitioning Problem: Overlap Gap Property and Algorithmic Barriers

David Gamarnik, Eren C. Kızıldağ
IEEE International Symposium on Information Theory (ISIT), 2022

Self-Regularity of Output Weights for Overparameterized Two-Layer Neural Networks

David Gamarnik, Eren C. Kızıldağ
IEEE International Symposium on Information Theory (ISIT), 2021

Computing the Partition Function of the Sherrington-Kirkpatrick Model is Hard on Average

David Gamarnik, Eren C. Kızıldağ
IEEE International Symposium on Information Theory (ISIT), 2020

High-Dimensional Linear Regression and Phase Retrieval via PSLQ Integer Relation Algorithm

David Gamarnik, Eren C. Kızıldağ
IEEE International Symposium on Information Theory (ISIT), 2019

Improved spiral chemical shift imaging at 3 Tesla using a 32-channel integrated RF-shim coil array

Eren C. Kızıldağ, Jason P. Stockmann, Borjan Gagoski, Bastien Guerin, P. Ellen Grant, Lawrence L. Wald, Elfar Adalsteinsson
International Society for Magnetic Resonance in Medicine (ISMRM), 2016
(Summa Cum Laude Award, Top 5%)

HONORS AND
AWARDS

- Columbia University, Distinguished Postdoctoral Fellowship at Statistics, 2022-2024.
- University of Waterloo, Postdoctoral Fellowship in Probability & Mathematical Data Science, 2022 (Declined).
- MIT Graduate Student Council Travel Grant, 2019.
- *Summa cum laude* award (top 5%) in the 24th annual meeting of International Society for Magnetic Resonance in Medicine (ISMRM), 2016.
- Ranked 2nd in the graduating class of Bogazici University, 2014.
- Turkish Educational Foundation Supreme Success Scholarship, 2011-2014.
- Bogazici University Presidential Fellowship, 2010-2014.
- Turkish Ministry of Education Scholarship, 2010-2014.
- Semi-Finalist in Oyun'2010, 15th Turkish Intelligence Competition, 2010.
- Ranked 2nd in the graduating class of Ankara Science High School, 2010.¹
- Ranked 11th among 1.8 million students in College Entrance Exam, 2010.
- Candidate in the Turkish team of the International Mathematical Olympiad (IMO), 2010.
- Silver Medal at International Silk Road Mathematical Competition, 2010.
- Bronze Medal at National Mathematical Olympiad, held by Scientific and Technological Research Council of Turkey (TUBITAK²), 2009.
- First rank at Mediterranean Mathematical Olympiad, 2009.
- First rank at Middle East Technical University Mathematical Competition, 2008.
- Bronze Medal at Mediterranean Mathematical Olympiad, 2007.
- Ranked 4th in the Centralized High School Entrance Exam, 2006.

¹A special high school that was modeled after Bronx High School of Science, with a curriculum tailored for gifted students.

²Turkish equivalent of NSF.

- Gold Medal at National Junior Mathematical Olympiad, held by TUBITAK, 2006.

SELECTED TALKS

- NYU Bruna Group Meeting, November 2022.
- Columbia University Theory Seminar, November 2022.
- Columbia University Statistics Seminar, September 2022.
- Random Structures and Algorithms, August 2022.
- IEEE International Symposium on Information Theory, July 2022.
- MIT Statistics and Data Science Conference (SDSCon), April 2022.
- MIT SIAM Seminar, March 2022.
- UIC Combinatorics and Probability Seminar, March 2022.
- MIT LIDS and Statistics Tea Talk, February 2022.
- MIT LIDS Student Conference, January 2022.
- Stanford Information Theory Forum, January 2022.
- Stanford CS Theory Lunch, January 2022.
- Bilkent University, Electrical & Electronics Engineering Seminar, January 2022.
- Simons Institute at UC Berkeley, Graduate Seminar, November 2021.
- Cornell ORIE Young Researchers Workshop, October 2021.
- IEEE International Symposium on Information Theory, July 2021.
- MIT LIDS and Statistics Tea Talk, May 2021.
- MIT LIDS Student Conference, January 2021.
- MIT Machine Learning Tea Talks, July 2020.
- IEEE International Symposium on Information Theory, July 2020.
- Machine Learning at MIT Retreat, February 2020.
- IEEE International Symposium on Information Theory, July 2019.

GRADUATE
COURSEWORK

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| <input type="checkbox"/> Information Theory (A+) | <input type="checkbox"/> Optimization Methods (A+) |
| <input type="checkbox"/> Fundamentals of Probability (A+) | <input type="checkbox"/> Digital Image Processing (A) |
| <input type="checkbox"/> Inference and Information (A) | <input type="checkbox"/> Data Acquisition & Image Recon. in MRI (A) |
| <input type="checkbox"/> Topics in Discrete Probability (A+) | <input type="checkbox"/> Fourier Analysis: Theory & Applications (A+) |
| <input type="checkbox"/> Real Analysis (A+) | |

TEACHING
EXPERIENCE

Massachusetts Institute of Technology

Residential:

- Teaching Assistant for 6.436 Fundamentals of Probability (Fall 2019).
- Teaching Assistant for 6.344 Digital Image Processing (Spring 2019).
- Teaching Assistant for 6.S077 Introduction to Data Science (Spring 2018).
- Teaching Assistant for 6.437 Inference and Information (Spring 2017).
- Conducted weekly recitations and office hours, prepared and graded problem sets and exams.

Online:

- Teaching Assistant for 6.431x Probability—The Science of Uncertainty and Data, an edX-based MOOC with 2k enrollments. Answered and moderated forum posts, developed problem sets and exams (Fall 2018).
- Developed 6.431x Probability—The Science of Uncertainty and Data (Fall 2017) and 18.650x Fundamentals of Statistics (Summer 2018).

REVIEWER FOR

Random Structures & Algorithms, IEEE Information Theory Workshop (ITW).

COMPUTING
SKILLS

C, MATLAB, \LaTeX .

LANGUAGES

Turkish (Native), English (Fluent).

PERSONAL

Citizen of Turkey, F-1 visa holder.