Youngtak Sohn

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EMPLOYMENT

Assistant Professor, Division of Applied Mathematics — 2024-present
Brown University

Postdoctoral Associate, Department of Mathematics — 2022-2024
Massachusetts Institute of Technology (MIT)
Postdoctoral mentors: Elchanan Mossel and Nike Sun

EDUCATION

Ph.D. in Statistics — Dec 2021
Stanford University (Advisor: Amir Dembo)
Thesis: Random constraint satisfaction problems and high-dimensional estimation

B.Sc. in Mathematics — Mar 2016
Seoul National University (summa cum laude)

PUBLICATIONS AND PREPRINTS

(Listed in reverse chronological order by appearance on the arXiv.)

1) Elchanan Mossel, Allan Sly and Youngtak Sohn,
"Weak recovery, hypothesis testing, and mutual information in stochastic block models and planted factor graphs",
Preprint available at https://arxiv.org/abs/2406.15957.

2) Erik Bates and Youngtak Sohn,
"Parisi formula for balanced Potts spin glass",
Communications in Mathematical Physics, accepted.

3) Andrea Montanari, Feng Ruan, Basil Saeed and Youngtak Sohn,
"Universality of max-margin classifiers",
Preprint available at https://arxiv.org/abs/2310.00176.

4) Evan Chang, Neel Kolhe and Youngtak Sohn,
"Upper bounds on the 2-colorability threshold of random d-regular k-uniform hypergraphs for $k \geq 3$",
Preprint available at https://arxiv.org/abs/2308.02075.

5) Allan Sly and Youngtak Sohn,
"Local geometry of NAE-SAT solutions in the condensation regime",
Conference version in *Proceedings of the 56th STOC* (2024), pp. 1083-1093.

6) Elchanan Mossel, Jonathan Niles-Weed, Youngtak Sohn, Nike Sun and Ilias Zadik,
"Sharp thresholds in inference of planted subgraphs",
Conference version in *Proceedings of the 36th COLT* (2023), pp. 5573-5577.

7) Elchanan Mossel, Allan Sly and Youngtak Sohn,
"Exact Phase Transitions for Stochastic Block Models and Reconstruction on Trees",
Annals of Probability, accepted.
Conference version in *Proceedings of the 55th STOC* (2023), pp. 96-102.

8) Yash Deshpande, Elchanan Mossel and Youngtak Sohn,
"Agreement and Statistical Efficiency in Bayesian Perception Models"
Preprint available at https://arxiv.org/abs/2205.11561.

9) Erik Bates and Youngtak Sohn,
"Crisanti-Sommers formula and simultaneous symmetry breaking in multi-species spherical spin glasses",
Communications in Mathematical Physics, 394 (2022), no. 3, pp. 1101-1152.

10) Erik Bates and Youngtak Sohn,
"Free energy in multi-species mixed p-spin spherical models",
Electronic Journal of Probability, 27 (2022), no. 52, pp. 1-75.

11) Danny Nam, Allan Sly and Youngtak Sohn,
"One-step replica symmetry breaking of random regular NAE-SAT II",
Communications in Mathematical Physics, 405 (2024), no. 61, pp. 61.

12) Danny Nam, Allan Sly and Youngtak Sohn,
"One-step replica symmetry breaking of random regular NAE-SAT I",
Preprint available at https://arxiv.org/abs/2011.14270,
Conference version in *Proceedings of 62nd FOCS* (2021), pp. 310-318.

13) Andrea Montanari, Feng Ruan, Youngtak Sohn and Jun Yan,
"The generalization error of max-margin linear classifiers: Benign overfitting and high dimensional asymptotics in the overparametrized regime ",
Preprint available at https://arxiv.org/abs/1911.01544.

14) Erik Bates, Leila Sloman and Youngtak Sohn,
"Replica symmetry breaking in multi-species Sherrington-Kirkpatrick Model",
Journal of Statistical Physics, 174 (2019), no. 2, pp. 333-350.

INVITED TALKS

1)	Lehigh Univerisity & University of Minnesota joint Probability Seminar	Mar 2024
2)	Probability Workshop in Korea	Jan 2024
3)	Brown Probability Seminar	Dec 2023
4)	Duke University Workshop in Operations Research and Data Science	Nov 2023
5)	Harvard CMSA Probability Seminar	Nov 2023
6)	Joint Statistical Meetings (JSM), Statistical learning theory session	Aug 2023
7)	Technical University of Dortmund Probability Seminar	Jun 2023
8)	UT Austin, Graduate Mini-School in Groups, Dynamics, and Probability	May 2023
9)	Seoul National University Probability and Machine Learning Seminar	Aug 2022
10)	Harvard Statistics Seminar	April 2022
11)	University of Illinois Chicago Combinatorics and Probability Seminar	April 2022
12)	Seoul National University Statistics Seminar	Oct 2021
13)	MIT Probability Seminar	May 2021

14) KAIST Probability Seminar — Dec 2020
15) Deep Learning (MoDL) Workshop — Dec 2020
16) Stanford Probability Seminar — Oct 2020
17) Korea Institute for Advanced Study(KIAS) Analysis/Probability Seminar — Aug 2020
18) Korea Institute for Advanced Study(KIAS) Analysis/Probability Seminar — Dec 2019

TEACHING EXPERIENCE

Instructor. Massachusetts Institute of Technology. — Fall 2023
Seminar in Theoretical Computer Science (Topic: Statistical learning theory)

Teaching Assistant. Stanford University.

MATH 21, Calculus	Summer 2021
STATS 219, Stochastic Processes	Winter 2021
STATS 310A, Theory of Probability I	Fall 2020
STATS 315B, Modern Applied Statistics: Data Mining	Spring 2020
STATS 203, Introduction to Regression Models and Analysis of Variance	Winter 2020, Summer 2017
STATS 110 Statistical Methods in Engineering and the Physical Sciences	Summer 2019
STATS 218, Introduction to Stochastic Processes II	Spring 2021, 2019, 2017
STATS 217, Introduction to Stochastic Processes I	Winter 2019, Summer 2018
STATS 300B, Theory of Statistics II	Winter 2018
STATS 305A, Introduction to Statistical Modeling	Autumn 2017
STATS 200, Inroduction to Statistical Inference	Winter 2017

RESEARCH MENTORSHIP

MIT PRIMES program — 2023
Students: Evan Chang and Neel Kolhe
Title: "Upper bounds on the 2-colorability threshold of random d-regular k-uniform hypergraphs for $k \geq 3$"

AWARDS AND HONORS

Probability Dissertation Award, Department of Statistics, Stanford University	2021
Graduate Study Fellowship, Korean Foundation for Advances Studies	2016-2021
Presidential Science Scholarship	2010-2016

ORGANIZATIONAL ACTIVITIES

Organizer for Deep Learning Theory Summer School and Workshop, Simons institute — Jul-Aug 2022

PROFESSIONAL SERVICE

Reviewer for Journals. Annals of Statistics, Probability Theory and Related Fields, Proceedings of the London Mathematical Society, Electronic Journal of Probability, Journal of Korean Statistical Society

Reviewer for Conferences Program committee for Conference of Learning Theory (COLT 2023, 2024), International Symposium on Information Theory (ISIT 2024)

WORK EXPERIENCE

Korean Augmentation to the United States Army (Mandatory), Sergeant 2012-2014

REFERENCES

Dr. Amir Dembo
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Department of Statistics and
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Stanford University.
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Dr. Elchanan Mossel
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Department of Mathematics,
Massachusetts Institute of Technology.
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Dr. Allan Sly
Professor,
Department of Mathematics,
Princeton University.
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Dr. Nike Sun
Associate Professor,
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