

Soham Jana

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Research Interests

Theoretical and methodological aspects of high-dimensional statistics, robust estimation, Markov decision process, non-parametric estimation.

Education

PhD. in Statistics and Data Science May 2022
Yale University, New Haven, CT, USA
Thesis: Learning non-parametric and high-dimensional distributions
via information-theoretic methods
Advisor: Prof. Yihong Wu

Master of Statistics (Hons.) (First class with distinction) May 2017
Indian Statistical Institute, Kolkata, West Bengal, India
Specialization: Theoretical Statistics
Dissertation: Characterization of single-integral non-kernel divergences
Advisor: Prof. Ayanendranath Basu

Bachelor of Statistics (Hons.) (First class with Distinction) May 2015
Indian Statistical Institute, Kolkata, West Bengal, India

Work experiences

University of Notre Dame, Notre Dame, IN, USA
Assistant Professor, Department of Applied and Computational Mathematics and Statistics. Starting August 2024

Department of Operations Research and Financial Engineering, Princeton University, Princeton, NJ, USA

Postdoc June 2022 – July 2024
Hosts: Prof. Sanjeev Kulkarni and Prof. Jianqing Fan

Researcher, The First Republic Bank Research and Lifelong Learning Program June 2022 – May 2023

Lecturer Spring 2023 and Fall 2023

Preprints (“*”: Authors list not in alphabetical order)

1. Soham Jana, Jianqing Fan, Sanjeev Kulkarni*. [A general theory for robust clustering via trimmed mean](#). arXiv preprint arXiv:2401.05574 (2024). (Submitted to the Annals of Statistics)
2. Soham Jana, Kun Yang, and Sanjeev Kulkarni*. [Adversarially robust clustering with optimality guarantees](#). arXiv preprint arXiv:2306.09977 (2023).
3. Soham Jana, Yury Polyanskiy, and Yihong Wu. [Optimal empirical Bayes estimation for the Poisson model via minimum-distance methods](#). arXiv preprint arXiv:2209.01328 (2022).

Journal publications (“*”: Authors list not in alphabetical order)

1. Soham Jana, Henry Li, Yutaro Yamada, and Ofir Lindenbaum. [Support recovery with Stochastic Gates: theory and application for linear models](#). Elsevier Signal Processing (2023), 213, p.109193.
2. Yanjun Han, Soham Jana and Yihong Wu, [Optimal Prediction of Markov Chains With and Without Spectral Gap](#), in IEEE Transactions on Information Theory, vol. 69, no. 6, pp. 3920-3959, June 2023, doi: 10.1109/TIT.2023.3239508. (**Extended from the NeurIPS version with analysis of higher-order Markov chains and different loss functions**)
3. Soham Jana and Ayanendranath Basu.* [A characterization of all single-integral, non-kernel divergence estimators](#). IEEE Transactions on Information Theory 65.12 (2019): 7976-7984.

Conference publications (“*”: Authors list not in alphabetical order)

1. Soham Jana, Yury Polyanskiy, Anzo Teh, and Yihong Wu. [Empirical Bayes via ERM and Rademacher complexities: the Poisson model](#). In Conference on Learning Theory 2023 Jul 15, PMLR 195:5199-5235.
2. Yanjun Han, Soham Jana, and Yihong Wu. [Optimal prediction of Markov chains with and without spectral gap](#). NeurIPS 2021.
3. Soham Jana, Yury Polyanskiy, and Yihong Wu. [Extrapolating the profile of a finite population](#). In Conference on Learning Theory 2020 Jul 15 (pp. 2011-2033). PMLR.

Talks

Neural information processing systems (NeurIPS)	Dec 2021
Conference on learning theory (COLT)	July 2020, July 2023

Teaching

Probability and stochastic systems (ORF 309/ENG 309/MAT 380)	Spring 2023
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Honors and awards

INSPIRE Scholarship, Govt. of India	2012-2017
Indian National Mathematical Olympiad (INMO) merit certificate (For being among top 75 in the country)	2012

Services**Paper reviewer**

Annals of Statistics

IEEE Transactions on Information Theory

IEEE International Symposium on Information Theory (ISIT)

Stat - an ISI Journal

Organizational duties at conferences*Joint Statistical Meetings*

August 2024

*Session chair: New Advances in Nonparametric Hypothesis Testing - Part I**IEEE Conference on Information Sciences and Systems*

March 2024

*Session chair: Machine learning and statistical inference***Yale S&DS M.A. admission committee**

2021

Reviewer: one of the committee members handling over
150 applications and making admission recommendations**Yale S&DS graduate reading group**

2020

Co-organizer Scheduled talks and lead discussion sessions

Yale Women in Data Science (WiDS) workshop

2020

Served as a mentor for Yale undergrad students participating
in the WiDS Datathon Challenge 2020**South Asian Graduate and Professional Association
at Yale (SAGA)**

2018 – 2021

Treasurer, core committee member and cultural committee head

Objective: organizing socio-cultural events to promote diversity and inclusion at Yale