

Soham Jana

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Updated on: November 30, 2023
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Research Interests

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

Education

PhD. in Statistics and Data Science Yale University, New Haven, CT, USA Thesis: Learning non-parametric and high-dimensional distributions via information-theoretic methods Advisor: Prof. Yihong Wu	2017–2022
Master of Statistics (Hons.) (First class with distinction) Indian Statistical Institute, Kolkata, West Bengal, India Specialization: Theoretical Statistics Dissertation: Characterization of single-integral non-kernel divergences Advisor: Prof. Ayanendranath Basu	2015–2017
Bachelor of Statistics (Hons.) (First class with Distinction) Indian Statistical Institute, Kolkata, West Bengal, India	2012–2015

Work experiences

Post-doctoral Research Associate Princeton University, Princeton, New Jersey, USA Research area: Robust clustering, data depth Advisors: Prof. Sanjeev Kulkarni and Prof. Jianqing Fan	2022–current
The First Republic Bank Research and Lifelong Learning Program Princeton University, Princeton, New Jersey, USA Advisors: Prof. Sanjeev Kulkarni, Prof. Ronnie Sircar, and Prof. Mete Soner Research area: Capital call line of credit, resource planning	2022–2023
Lecturer Princeton University, Princeton, New Jersey, USA	Spring 2023–current

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). (Submitted to the Journal of the American Statistical Association)
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). To be submitted to Information and Inference: A Journal of the IMA.

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)	2021
Conference on learning theory (COLT)	2020, 2023

Teaching (at Princeton University)

Probability and stochastic systems ORF 309/ENG 309/MAT 380	Spring 2023
Statistical Machine Learning ORF 570 (Assistant Instructor under Prof. Jianqing Fan)	Fall 2023

Graduate teaching assistant (at Yale University)

Stochastic processes S&DS 351–551. Instructor: Prof. Joseph Chang	Spring 2021
Information theory S&DS 364–664. Instructor: Prof. Andrew Barron	Fall 2020

Probability theory S&DS 241–541. Instructor: Prof. Winston Lin	Fall 2019
Advanced probability S&DS 400–600. Instructor: Prof. Sekhar Tatikonda	Spring 2019
Statistical inference S&DS 410–610. Instructor: Prof. Zhou Fan	Fall 2018
Stochastic Process S&DS 251–551. Instructor: Prof. Sahand Negahban	Spring 2018

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 IEEE Transactions on Information Theory, Stat - an ISI Journal	
Yale S&DS M.A. admission committee Reviewer: one of the committee members handling over 150 applications and making admission recommendations	2021
Yale S&DS graduate reading group Co-organizer Scheduled talks and lead discussion sessions	2020
Yale Women in Data Science (WiDS) workshop Served as a mentor for Yale undergrad students participating in the WiDS Datathon Challenge 2020	2020
Yale South Asian Graduate and Professional Association (SAGA) Treasurer, core committee member and cultural committee head Objective: organizing socio-cultural events to promote diversity and inclusion at Yale	2018- 2021