

Soham Jana

Postdoctoral Research Associate,
Operations Research and Financial Engineering,
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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

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| 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: 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: Ayanendranath Basu | 2015–2017 |
| Bachelor of Statistics (Hons.) (First class with Distinction) Indian Statistical Institute, Kolkata, West Bengal, India | 2012–2015 |

Work experience

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| Post-doctoral research associate Princeton University, Princeton, New Jersey, USA Research area: Robust clustering, data depth Advisor: I am working jointly with Sanjeev Kulkarni and Jianqing Fan | 2022–current |
| The First Republic Bank Research and Lifelong Learning Program Princeton University, Princeton, New Jersey, USA Advisors: Sanjeev Kulkarni, Roni Sircar, Mete Soner Research area: Capital call line of credit, resource planning | 2022–2023 |

Publications and preprints (Authors lists that are not in alphabetical order denoted by “*”)

1. Soham Jana, Kun Yang, and Sanjeev Kulkarni*. **Adversarially robust clustering with optimality guarantees**. arXiv preprint arXiv:2306.09977 (2023).
2. Soham Jana, Yury Polyanskiy, Anzo Teh, and Yihong Wu. **Empirical Bayes via ERM and Rademacher complexities: the Poisson model**. To appear in Conference on Learning Theory (2023).

3. 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**)
4. 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).
5. Soham Jana, Henry Li, Yutaro Yamada, and Ofir Lindenbaum. [Support recovery with Stochastic Gates: theory and application for linear models](#). arXiv preprint arXiv: 2110.15960 (2021).
6. Yanjun Han, Soham Jana, and Yihong Wu. [Optimal prediction of Markov chains with and without spectral gap](#). NeurIPS 2021.
7. 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.
8. 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.

Talks

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

Course Instructor

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| Probability and stochastic systems ORF 309/ENG 309/MAT 380 | Spring 2023 Princeton University |
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Graduate teaching assistance

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| Stochastic processes S&DS 351–551/EENG 434/ENAS 502 Instructor: Joseph Chang | Spring 2021 Yale University |
| Information theory S&DS 364–664/EENG 454 Instructor: Andrew Barron | Fall 2020 Yale University |
| Probability theory S&DS 241–541 Instructor: Winston Lin | Fall 2019 Yale University |
| Advanced probability S&DS 400–600/Math 600 Instructor: Sekhar Tatikonda | Spring 2019 Yale University |

Statistical inference
S&DS 410-610
Instructor: Zhou Fan

Fall 2018
Yale University

Honors and awards

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

Services

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| Paper reviewer IEEE Transactions on Information Theory | |
| 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 |