

# Soham Jana

Postdoctoral Research Associate,  
Operations Research and Financial Engineering,  
Princeton University

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Website: <https://janasoham.github.io>  
Email: [soham.jana@princeton.edu](mailto:soham.jana@princeton.edu)

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

## Work experience

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|---|--------------|
| <b>Post-doctoral research associate</b><br>Princeton University, Princeton, New Jersey, USA<br>Research area: Robust clustering, data depth<br>Advisor: I am working jointly with Sanjeev Kulkarni and Jianqing Fan                               | 2022–current |
| <b>The First Republic Bank Research and Lifelong Learning Program</b><br>Princeton University, Princeton, New Jersey, USA<br>Advisors: Sanjeev Kulkarni, Roni Sircar, Mete Soner<br>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). (Submitted)
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). (Under major revision at Elsevier Signal Processing)
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

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

## Course Instructor

<b>Probability and stochastic systems</b> ORF 309/ENG 309/MAT 380	Spring 2023 Princeton University
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## Graduate teaching assistance

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

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

### Services

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