

# 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

<b>PhD. in Statistics and Data Science</b> Yale University, New Haven, CT, USA Thesis: Learning non-parametric and high-dimensional distributions via information-theoretic methods Advisor: Prof. Yihong Wu	2017–2022
<b>Master of Statistics (Hons.)</b> (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
<b>Bachelor of Statistics (Hons.)</b> (First class with Distinction) Indian Statistical Institute, Kolkata, West Bengal, India	2012–2015

## Work experiences

<b>Post-doctoral Research Associate</b> Princeton University, Princeton, New Jersey, USA Research area: Robust clustering, data depth Advisors: Prof. Sanjeev Kulkarni and Prof. Jianqing Fan	2022–current
<b>The First Republic Bank Research and Lifelong Learning Program</b> 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
<b>Lecturer</b> Princeton University, Princeton, New Jersey, USA	Spring 2023, 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)	2021
Conference on learning theory (COLT)	2020, 2023

#### Teaching (at Princeton University)

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

#### 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**

Session Chair

*Machine learning and statistical inference session*

March 2024

*IEEE Conference on Information Sciences and Systems (CISS)*

**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

**Yale South Asian Graduate and Professional Association (SAGA)**

2018- 2021

Treasurer, core committee member and cultural committee head

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