

# Soham Jana

Sherrerd Hall, Room 213  
Princeton University  
Princeton, NJ, USA

Updated on: April 4, 2024  
Website: <https://janasoham.github.io>  
Email: [soham.jana@princeton.edu](mailto:soham.jana@princeton.edu)  
Phone: +1 917-520-7112

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

#### Teaching

Probability and stochastic systems ORF 309/ENG 309/MAT 380	Spring 2023
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## Statistical Machine Learning

Fall 2023

ORF 570 (Assistant Instructor with primary Instructor Prof. Jianqing Fan)

### Honors and awards

INSPIRE Scholarship, Govt. of India 2012-2017

Indian National Mathematical Olympiad (INMO) merit certificate 2012  
(For being among top 75 in the country)

### 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