

ACADEMIC POSITIONS

University of Pennsylvania
Postdoctoral Researcher in Biostatistics

Philadelphia, USA
August 2023–July 2024

EDUCATION

Columbia University
Ph.D. in Statistics (with specialization in Data Science), Advisor: Ming Yuan
– GPA: 4.06

New York, USA
Fall 2018–Summer 2023

Indian Statistical Institute
M.Stat., with Distinction
– Specialization: Theoretical Statistics

Kolkata, India
2016–2018

Indian Statistical Institute
B.Stat., with Distinction

Kolkata, India
2013–2016

RESEARCH INTERESTS

In my Ph.D. I have worked on problems at the intersection of Statistics, Optimization and theoretical Computer Science. More specifically, my research is on tensors and the statistical and computational trade-offs appearing in the application of tensor methods. I am broadly interested in spectral methods for high dimensional data analysis. I have also worked on detection thresholds of some nonparametric methods.

PREPRINTS AND PUBLICATIONS

1. KhudaBukhsh, W. R., **Auddy, A.**, Disser, Y., & Koeppl, H. (2018). Approximate lumpability for Markovian agent-based models using local symmetries. *Journal of Applied Probability*, 56 (3), 647-671.
2. **Auddy, A.**, & Yuan, M. (2020). Perturbation Bounds for (Nearly) Orthogonally Decomposable Tensors with Statistical Applications. *Information and Inference: A Journal of the IMA*, 12(2), 1044-1072.
3. **Auddy, A.**, & Yuan, M. (2021). On Estimating Rank-one Spiked Tensors in the Presence of Heavy Tailed Errors. *IEEE Transactions on Information Theory*, 68(12), 8053-8075.
4. Bhattacharyya, R., et al. (2021). Role of Multi-resolution Vulnerability Indices in COVID-19 spread: A Case Study in India. *British Medical Journal Open*, 12(11), e056292.
5. **Auddy, A.**, Deb, N. & Nandy, S. (2021). Exact Detection Thresholds for Chatterjee's Correlation. *arXiv preprint arXiv: 2104.15140*, accepted by *Bernoulli*
6. **Auddy, A.**, & Yuan, M. (2022). Tucker Decomposition with Sparsity in the Core: Identifiability, Stability and Computability. available upon request
7. **Auddy, A.**, & Yuan, M. (2023). Large Dimensional Independent Component Analysis: Statistical Optimality and Computational Tractability. *arXiv preprint arXiv:2303.18156*, major revision requested by *The Annals of Statistics*

8. Arya, S., **Auddy, A.**, Edmonds, R., Lim, S., Memoli, F., Packer, D. (2023). The Gromov-Wasserstein distance between spheres. *arXiv preprint arXiv:2306.10586*.
9. **Auddy, A.**, Zou, H., Rahnema Rad, K. & Maleki, A. (2023+). Approximate Leave-one-out Cross Validation for Regression with ℓ_1 Regularizers. *arXiv preprint arXiv:2310.17629*.
10. **Auddy, A.**, Deb, N. & Sen, B. (2023+). Statistical Inference for the Fourth Order Blind Identification Estimator in High Dimensions. in preparation

OTHER ONGOING PROJECTS

- Noise Robust Algorithms for Overcomplete Tensor CP Decomposition 2023
with Yuefeng Han, Ming Yuan and Cun-Hui Zhang

HONORS AND AWARDS

- Course Assistant award from Columbia Data Science Institute 2022
- Ph.D. scholarship: Dean's fellow at Columbia University 2018–2023
- Prize money for good academic performance in M.Stat. 2017
- KVPY fellowship (stream SA), from Department of Science and Technology, Government of India 2013–2018
- Runner up in the **CRISIL** Young Thought Leader Essay Competition 2016
- Ranked in the top 1 percent among 40721 students in National Standard Exam in Physics (NSEP) 2013

INVITED TALKS

- Why and How to use Orthogonally Decomposable Tensors,
 - ENAR Spring Meeting, March 2022, Houston TX
 - Statistical Learning Reading Group, September 2022, Statistics department, Ohio State University
- High Dimensional Data Analysis using Orthogonally Decomposable Tensors,
 - IMS Annual Meeting, June 2022, London UK
 - Yale FDS Seminar, January 2023
 - OSU Statistics Seminar, February 2023
- Statistical and Computational Tradeoffs in Statistical Inference using Orthogonally Decomposable Tensors, INFORMS, October 2022, Indianapolis IN
- Computational and Statistical Limits in High Dimensional Independent Component Analysis,
 - CMStatistics, December 2022, London UK
 - ICSA Applied Statistics Symposium, June 2023, Ann Arbor MI
- Gromov Wasserstein distances for uniformly distributed points on spheres, Joint Mathematics Meeting, January 2023, Boston US

CONTRIBUTED TALKS

- Perturbation Bounds for Odeco Tensors, JSM 2020 (virtual)
- Why and how to use Orthogonally Decomposable Odeco Tensors, NISS 2022 (virtual)

WORKSHOPS

- Data Science at the Crossroads of Analysis, Topology and Geometry, AMS MRC, Buffalo NY June 2022
- SIAM Conference on Algebraic Geometry in Bern July 2019
- Workshop on ‘Challenges in High-dimensional Data’ at Columbia University September 2018

TEACHING AND TEACHING ASSISTANTSHIP

I have taught the following course:

- Introduction to Statistics without Calculus (undergrad) Summer 2022

I have been the teaching assistant on the following courses. My responsibilities included helping students with coursework and software applications, as well as grading and holding recitation sessions.

- Statistical Inference II (Ph.D. level) Spring 2023
- Statistical Inference (Masters level) Fall 2022
- Statistical Inference and Modeling (Masters level) Fall 2021, Spring 2022
- **Received the Course Assistant award from Columbia Data Science Institute**
- Multivariate Statistical Methods (Masters level) Spring 2021
- Linear Regression Models (Masters level) Fall 2020
- Generalized Linear Models (Masters level) Spring 2020
- Bayesian Statistics (Masters level) Fall 2019
- Nonparametric Statistics (Masters level) Spring 2019
- Probability and Inference (Masters level) Fall 2018

INDUSTRY EXPERIENCE

- **Amazon** (Summer 2021): Research Scientist Intern. Worked on causal inference and empirical Bayes noise reduction with the Marketing Measurement team.

SERVICES

- I have reviewed papers for Annals of Statistics, IEEE- Trans. Inf. Theory, IEEE Trans. Signal Process., Bernoulli, Statistics and Probability Letters, and SODA (conference).
- I have co-organized the Stats department student seminar in 2021-22.

SKILLS

- **Statistical softwares:** R (advanced), Python (intermediate)
- **Languages:** Fluent in English, Bengali and Hindi. Elementary knowledge of French.