Arnab Auddy

Website: arnab-auddy.github.io
Email: arnab.auddy@columbia.edu
Phone: +1 919-590-7146
LinkedIn: arnab-auddy-45372274

Education

Columbia University — New York, USA
Ph.D. in Statistics, Advisor: Ming Yuan — Fall 2018–Present
- GPA: 4.06

Indian Statistical Institute — Kolkata, India
M.Stat., with Distinction — 2016–2018
- Specialization: Theoretical Statistics

Indian Statistical Institute — Kolkata, India
B.Stat., with Distinction — 2013–2016

Research Interests

My Ph.D. research is on tensors and the statistical and computational tradeoffs appearing in the application of tensor methods. I am broadly interested in spectral methods for high dimensional data analysis. I have also worked on nonparametric methods of independence testing.

Some Ongoing Projects

- Computationally Efficient High Dimensional Independent Component Analysis — 2022
  with Ming Yuan (Columbia University)
- Tensor Tucker Decomposition via Dictionary Learning — 2022
  with Ming Yuan (Columbia University)
- Approximate Leave-one-out Cross Validation in High Dimensional Regression — 2022
  with Arian Maleki (Columbia University)
- Fast Approximations of Gromov-Wasserstein Distances for Spherical Data — 2022
  with Facundo Memoli (Ohio State University)

Preprints and Publications

1. **Auddy, A.**, & Yuan, M. (2021). On Estimating Rank-one Spiked Tensors in the Presence of Heavy Tailed Errors. *IEEE Transactions on Information Theory*, https://ieeexplore.ieee.org/document/9832007
2. **Auddy, A.**, Deb, N. & Nandy, S. (2021). Exact Detection Thresholds for Chatterjee's Correlation. *arXiv preprint arXiv: 2104.15140*
3. Bhattacharyya, R., et al. (2021). Role of Multi-resolution Vulnerability Indices in COVID-19 spread: A Case Study in India. medRxiv https://bit.ly/3CRJqMA, accepted at *BMJ Open*
4. **Auddy, A.**, & Yuan, M. (2020). Perturbation Bounds for (Nearly) Orthogonally Decomposable Tensors with Statistical Applications. *arXiv preprint arXiv:2007.09024*, accepted at *Information and Inference: A Journal of the IMA*

5. 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.

Industry Experience

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

Invited Talks

- Why and How to use Orthogonally Decomposable Tensors:
  - ENAR Spring Meeting, March 2022, Houston TX
  - September 2022, Statistical Learning Reading Group, Statistics department, Ohio State University
- High Dimensional Data Analysis using Orthogonally Decomposable Tensors,
  IMS Annual Meeting, June 2022, London UK
- Statistical and Computational Tradeoffs in Statistical Inference using Orthogonally Decomposable Tensors,
  INFORMS, October 2022, Indianapolis IN (upcoming)
- Computational and Statistical Limits in High Dimensional Independent Component Analysis,
  CMStatistics, December 2022, London UK (upcoming)

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, June 2022, Buffalo NY

Skills

- **Statistical softwares:** advanced R, intermediate Python

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 (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

Scholarships and Awards

- 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
- Ranked in the top 1 percent among 40721 students in National Standard Exam in Physics (NSEP) — 2013

Other Details

- Participated in the SIAM Conference on Algebraic Geometry in Bern — July 2019
- Participated in workshop on 'Challenges in High-dimensional Data' at Columbia University — September 2018
- Runner up in the **CRISIL** Young Thought Leader Essay Competition — 2016
- Languages known: Fluent in English, Bengali and Hindi. Elementary knowledge of French.