Navonil Deb

nd329@cornell.edu | navonildeb.github.io |
329 CIS Building, 127 Hoy Road, Ithaca, NY 14853

Education

- **Ph.D. Candidate**, Department of Statistics and Data Science — *Fall 2021 - Spring 2026 (Expected)*
  Bowers College of Computing and Information Science
  Cornell University
  Doctoral Advisor: Sumanta Basu
  Minor field: Operations Reseach and Information Engineering
- **Master of Statistics**, Indian Statistical Institute Kolkata — *Fall 2019 - Spring 2021*
  Graduate with Dissertation
  Specialization: Financial Statistics
- **Bachelor of Statistics** (Hons.), Indian Statistical Institute Kolkata — *Fall 2016 - Spring 2019*

Research Interests

My research focuses on developing statistically principled methodologies for analyzing large-scale and dependent data with complex structures arising across diverse domains. I aim to make such dependencies learnable through methodologies with theoretical guarantees and scalable computational algorithms. Broadly, my work lies at the intersection of **Time Series Analysis**, **High-Dimensional Statistics**, **Graphical Models** and **Causal Inference**.

Scholarly Manuscripts

(Title is hyperlinked to the online pdf, $*$ denotes equal contribution)

Preprints under Review

1. **Navonil Deb**, Raaz Dwivedi, Sumanta Basu (2025). Counterfactual Forecasting for Panel Data. arXiv:2511.06189. *Submitted to ICML.*
2. **Navonil Deb**, Amy Kuceyeski, and Sumanta Basu (2024). Regularized Estimation of Sparse Spectral Precision Matrices. arXiv:2401.11128. *Submitted to JMLR.*

Working Papers

1. **Navonil Deb***, Younghoon Kim*, Sumanta Basu. Inference for High-dimensional Sparse Spectral Precision Matrices. (In preparation)

Interdisciplinary Research

1. Robin Radcliffe, Robin Desmond Gleed, Ava Cable, **Navonil Deb**. Predicting the Body Weight of Endangered Rhinoceroses in Namibia (In preparation).

   Role: Designed data-driven statistical model to predict the body weight of endangered rhinoceroses from morphological measurements and demographic data, aiding rhino air-transport planning and veterinary health management.

2. Sayan Paul, Dhruba Nandi, **Navonil Deb**, Amy Kuceyeski, Sumanta Basu and Sreyoshi Das. Predicting Cognitive Scores and Demographics Using Resting State Functional MRI Features (In preparation).

   Role: Designed penalized logistic regression models with feature engineering to uncover sex-independent and sex-specific neurobiological univariate correlates of cognitive performance in healthy individuals, providing insights into sex-differentiated patterns of cognitive impairment in neurological diseases.

Other Research Experience and Reports

1. **Navonil Deb***, Abhinandan Dalal* and Gopal Krishna Basak (2020). Finding Optimal Cancer Treatment using Markov Decision Process to Improve Overall Health and Quality of Life. arXiv:2011.13960.
2. **Navonil Deb** and Arijit Chakrabarti. Some Contributions to Inference and Model Selection in High Dimensional Statistics (2021). Master's dissertation.

Software

(* denotes equal contribution)

- `cxreg`: An R Package for Complex-Valued Lasso and Graphical Lasso, includes optimized Fortran subroutines for efficient large-scale computation.
  Authors: Younghoon Kim*, **Navonil Deb*** and Sumanta Basu link
  (Submitted to the *Journal of Open Source Software*.)

Conference Presentations

Regularized Estimation of Sparse Spectral Precision Matrices

1. Spring Research Conference, Baruch College - CUNY, New York NY (Invited Talk). *May 2025*
2. CMStatistics, King's College, London (Invited virtual talk). *Dec 2024*
3. IMS Congress, Bochum, Germany. *August 2024*
4. JSM, Toronto, ON Canada. *Aug 2023*
5. NESS Symposium, Boston University, Boston MA (Invited Talk). *June 2023*
6. PhD students seminar, Department of Statistics and Data Science, Cornell University, Ithaca NY (Invited talk). *May 2023*
7. Conference on Advances in Time Series, UChicago Booth (Invited Poster). *May 2023*
8. IISA, Bangalore, India. *De 2022*
9. NBER-NSF Time Series Conference, Boston University, Boston MA (Selected poster). *Fall 2022*

Counterfactual Forecasting for Panel Data

1. JSM, Nashville, TN. *Aug 2025*
2. PhD students seminar, Department of Statistics and Data Science, Cornell University, Ithaca NY (Invited talk). *Dec 2024*

Teaching Experience

Teaching Assistant for Undergraduate Courses at Cornell

1. Theory of Statistics (STSCI 4090). *Fall 2025*
2. Applied Time Series Analysis (STSCI 4550). *Spring 2026, Spring 2025, Spring 2024, Spring 2023*
3. Probability Models and Inference (STSCI 3080). *Fall 2024*
4. Linear Models with Matrices (STSCI 4030). *Fall 2023*
5. Statistical Sampling (STSCI 3100). *Fall 2022*

Teaching Assistant for Graduate Courses at Cornell

1. Probability II for Statistics (STSCI 6750).
2. Statistical Computing I (STSCI 6520). *Fall 2024*
   Guest lecture on Complex-valued optimization in high dimension with real-complex ring isomorphism.

Research Internship Experience

1. Research Internat at **Self-Organizing Systems (SOS) Lab, Technische Universität (TU) Darmstadt, Germany** (virtual due to Covid 19). On The Asymptotic Behavior of the Moments of the Causal Estimator for the Input in a Poisson Channel.
   Supervisor: Heinz Köppl and Mark Sinzger. *May 2020 - Nov 2020*

2. Short-term summer intern at **National Institute of Biomedical Genomics, India**. A Coalescent Process Framework for Reconstructing Historical Population Genomic Structure.
   Supervisor: Dr. Analabha Basu. *May 2019 - July 2019*

Awards

1. Undergraduate and Masters studies supported by **Kishore Vaigyanik Protsahan Yojana (KVPY)** award by Department of Science & Technology (DST), Government of India.
2. Recipient of **Prize Money Award** for outstanding performance in four semesters during undergraduate and masters studies in Indian Statistical Institute.

Technical Skills

Programming	R, Python, Fortran, C, C++ (rudimentary).
Computing Platform	BioHPC.
Software	RStudio, Jupyter.
Applications	LaTeX, Git, Excel.

Academic Services

1. Lab organizer of Statistical Modeling of Complex Systems (SMOCS) at Cornell. *Fall 2024*
2. Session Chair for "Recent Developments in Causal Inference", JSM, Toronto, ON Canada. *Aug 2023*
3. Reading group organizer on Causal Machine Learning in Longitudinal Data at Cornell. *Spring 2023*
4. Reviewer for Journal of Business & Economic Statistics, Computational Statistics, Sankhya A.