Snigdha Panigrahi

WORK ADDRESS: Department of Statistics, 451 West Hall,
1085 South University,
Ann Arbor, MI 48109.

EMAIL: psnigdha@umich.edu

HOMEPAGE: https://snigdha-panigrahi.netlify.app

Appointments

Associate Professor — **University of Michigan**
Department of Statistics — *August 2025 – Present*

Associate Professor — **University of Michigan**
Department of Biostatistics (Courtesy Appointment) — *August 2025 – Present*

Assistant Professor — **University of Michigan**
Department of Statistics — *September 2018 – August 2025*

Assistant Professor — **University of Michigan**
Department of Biostatistics (Courtesy Appointment) — *January 2022 – August 2025*

Visiting Researcher — **Massachusetts Institute of Technology**
Institute for Data, Systems, and Society — *January 2019 - August 2019*

Education

Ph.D. in Statistics — **Stanford University**
Advisor: Prof. J. Taylor — *2013 – 2018*

Master in Statistics — **Indian Statistical Institute, Kolkata**
Specialization: Mathematics, Statistics and Probability. — *2011-2013*

Bachelor in Statistics — **Indian Statistical Institute, Kolkata**
2008-2011

Research Interests

Data aggregation, Data integration, Decision theory and inference, Non-parametric statistics, Probabilistic approximations, Random fields, Randomization methods, Selective inference.

Awards and honors

Recognized by the Bernoulli Society New Researcher Award in Mathematical Statistics, 2025.

Recognized as an early career investigator by the NSF CAREER Award in the 2023 funding cycle.

Elected as a member of the International Statistical Institute, 2021.

Recipient of the NBHM (National Board for Higher Mathematics) Scholarship from the Department of Atomic Energy, Government of India in 2011.

Recipient of the INSPIRE Scholarship from the Department of Science and Technology, Government of India from 2008 to 2013.

Publications

Graduate student authors are underlined and undergraduate student authors are underlined and also marked with a dagger (†).

ACCEPTED/ PUBLISHED

[P21] R. Perry, **S. Panigrahi**, D. Witten and J. Bien. Inference on the proportion of variance explained in principal component analysis. Accepted at: *Journal of the American Statistical Association*. 2025. Preprint available at: `https://arxiv.org/abs/2402.16725`

[P20] Y. Huang, **S. Panigrahi**, and W. Dempsey. Selective Inference for Sparse Graphs via Neighborhood Selection Accepted at: *Electronic Journal of Statistics, Volume 19, Number 2, Pages 4083–4116*. 2025.

[P19] Y. Huang†, S. Pirenne, **S. Panigrahi**, and G. Claeskens. Selective Inference using Randomized Group Lasso Estimators for General Models. *Electronic Journal of Statistics, Volume 19, Number 2, Pages 3489–3531*. 2025.

[P18] Y. Wang, **S. Panigrahi**, and X. He. Asymptotically-exact Selective Inference for Quantile Regression. Accepted at: *Annals of Statistics*. 2025. Preprint available at: `https://arxiv.org/pdf/2404.03059`

[P17] S. Liu, and **S. Panigrahi**. Selective Inference with Distributed Data. *Journal of Machine Learning Research, Volume 26, Number 12, Pages 1–44*. 2025.

[P16] **S. Panigrahi**, J. Wang, and X. He. Treatment Effect Estimation via Efficient Data Aggregation. *Bernoulli, Volume 31, Number 4, Pages 2545–2568*. 2025.

[P15] K. Fry, **S. Panigrahi**, and J. Taylor. Assumption-Lean Data Fission with Resampled Data. *Journal of the American Statistical Association, Volume 120, Number 549, Pages 161–161*. 2024.

[P14] **S. Panigrahi**, K. Fry, and J. Taylor. Exact Selective Inference with Randomization. *Biometrika, Volume 111, Number 4, Pages 1109–1127*. 2024.

[P13] **S. Panigrahi**, N. Stewart, C. Sripada, and E. Levina. Selective Inference for Sparse Multitask Regression with Applications in Neuroimaging. *Annals of Applied Statistics, Volume 18, Number 1, Pages 445–467*. 2024.

[P12] **S. Panigrahi**. Carving Model-free Inference. *Annals of Statistics, Volume 51, Number 6, Pages 2318–2341*. 2023.

[P11] **S. Panigrahi**, P. W. MacDonald, and D.Kessler. Approximate Post-Selective Inference for Regression with the Group LASSO. *Journal of Machine Learning Research, Volume 24, Number 79, Pages 1–49*. 2023.

[P10] **S. Panigrahi**, S. Mohammad, A. Rao, and V. Baladandayuthapani Integrative Bayesian models using Post-selective Inference: a case study in Radiogenomics. *Biometrics, Volume 79, Number 3, Pages 1801–1813*. 2022.

[P9] **S.Panigrahi**, and J. Taylor. Approximate Selective Inference via Maximum Likelihood. *Journal of the American Statistical Association, Volume 118, Number 544, Pages 2810–2820*. 2022.

[P8] **S. Panigrahi**, P. Roy, and Y. Xiao. Maximal Moments and Uniform Modulus of Continuity for Stable Random Fields. *Stochastic processes and their applications, Volume 136, Pages 92–124*. 2021.

[P7] **S. Panigrahi**, J. Taylor, and A. Weinstein. Integrative methods for Post-selection Inference under Convex Constraints. *Annals of Statistics, Volume 49, Number 5, Pages 2803–2824*. 2021.

[P6] B. Saeed†, **S. Panigrahi**, and C. Uhler. Causal Structure Discovery from Distributions Arising from Mixtures of DAGs. *International Conference on Machine Learning, PMLR Pages 8336–8345*. 2020.

[P5] **S. Panigrahi**, J. Zhu, and C.Sabatti. Selection-adjusted Inference: an application to confidence intervals for *cis*-eQTL effect sizes. *Biostatistics, Volume 22, Number 1, Pages 181–197*. 2019.

[P4] Q. Zhao, and **S. Panigrahi**. Selective Inference for Effect Modification: An Empirical Investigation. *Observational Studies, Volume 5, Number 2, Pages 131–140*. 2019.

[P3] **S. Panigrahi**, N. Fawaz, and A. Pudhiyaveetil. Temporal Evolution of Behavioral User Personas via Latent Variable Mixture models. *IUI Workshops' 19, CEUR-WS Volume 2327*. 2019.

[P2] **S. Panigrahi**, and J. Taylor. Scalable methods for Bayesian Selective Inference. *Electronic Journal of Statistics, Volume 12, Number 2, Pages 2355–2400* 2018.

[P1] **S. Panigrahi**, J. Taylor, and S. Vadlamani. Kinematic Formula for Heterogeneous Gaussian Related Fields. *Stochastic processes and their applications, Volume 129, Number 7, Pages 2437–2465*. 2018.

SUBMITTED/ IN REVISION

[S8] D. Wu, J. Bien, and **S. Panigrahi**. Hierarchical Clustering with Confidence. 2025. Preprint available at: `http://arxiv.org/abs/2512.06522`.

[S7] S. Bakshi, and **S. Panigrahi**. Classification trees with Valid Inference via the Exponential Mechanism. 2025. Preprint available at: `https://arxiv.org/pdf/2511.15068`.

[S6] Y. Huang, **S. Panigrahi**, G. Yu, and J. Bien. Reluctant Interaction Inference after Additive Modeling. 2025. In revision for: *Journal of Machine Learning Research*. Preprint available at: `https://arxiv.org/pdf/2506.01219`.

[S5] S. Guglielmini, G. Claeskens, and **S. Panigrahi**. Selective Inference in Graphical Models via Maximum Likelihood. 2025. Preprint available at: `https://arxiv.org/abs/2503.24311`.

[S4] S. Liu, and **S. Panigrahi**. Flexible Selective Inference with Flow-based Transport Maps. 2025. In revision for: *Journal of the American Statistical Association*. Preprint available at: `https://arxiv.org/pdf/2506.01150`.

[S3] S. Liu, **S. Panigrahi**, and J. Soloff. Cross-validation with Antithetic Gaussian Randomization. In revision for: *Journal of the Royal Statistical Society Series B*. 2024+ Preprint available at: `https://arxiv.org/abs/2412.14423`.

[S2] S. Bakshi, W. Dempsey, and **S. Panigrahi**. Selective Inference for Time-Varying Effect Moderation. 2024+ Preprint available at: `https://arxiv.org/abs/2411.15908`.

[S1] Y. Huang, S. Bakshi, **S. Panigrahi**, and W. Dempsey. Inference with Randomized Regression Trees. 2024+. Preprint available at: `https://arxiv.org/abs/2412.20535`.

OTHER REPORTS

[O2] **S. Panigrahi**, J. Markovic, and J. Taylor.An MCMC-free approach to post-selective inference. 2017. Preprint available at: `https://arxiv.org/abs/1703.06154`.

[O1] X. Tian, **S. Panigrahi**, J. Markovic, N. Bi, and J. Taylor. Selective sampling after solving a Convex Problem. 2017. Preprint available at: `https://arxiv.org/abs/1609.05609`.

Funding

CURRENT

1. **NSF CAREER AWARD DMS-2337882**. Perturbation Methods for Quantifying Uncertainties in Machine Learning Models. Amount: **$450,000**. Dates: **July 2024 – July 2029**. Role: **PI**.

2. **NIH R01**. Leveraging ML Algorithms and Data Integration Techniques to improve Efficiency of Causal Moderation Analyses of Micro-randomized trial data. Estimated Amount: **$1,223,984**. Dates: **March 2024 – November 2027**. Role: **Co-I**, joint with PI W. Dempsey, Dept. of Biostatistics.

COMPLETED

1. **NSF DMS-2113342**. Reusing Data Efficiently for Iterative and Integrative Inference. Amount: **$150,000**. Dates: **August 2021 – July 2024**. Role: **PI**.

2. **Award by Departments of Statistics and Biostatistics**. Uncertainty Quantification for Learned Networks from Heterogeneous Data. Amount: **$10,000**. Role: **PI**, joint with co-PI W. Dempsey, Dept. of Biostatistics.

3. **NSF DMS-1951980**. Quantile-Based Modeling for Large-Scale Heterogeneous Data. Amount: **$300,000**. Dates: **June 2020 – May 2024**. Role: **PI**.

Patents

1. Apparatus and method for recording transition history and selecting next playback from the transition history, US20170366860A1.

2. Content search and pacing configuration, Application: US16066135.

3. Apparatus and method for concurrent video viewing with user-added realtime content, Application: US15774485.

4. Apparatus and method for providing customized ratings for a user, US20170337196A1.

Talks and Tutorials

[T50] Bernoulli New Researcher Lecture: ISI World Congress, Hague. October 2025.

[T49] Invited Talk: IISA Conference, Nebraska. June 2025.

[T48] Colloquium between the Harvard Biostatistics and Dana Farber Cancer Institute, Harvard University, April 2025.

[T47] Statistics Seminar, Duke University, March 2025.

[T46] Invited Talk: International Seminar on Selective Inference. March 2025.

[T45] Invited Talk: SEEDS Conference, University of Southern California, January 2025.

[T44] Invited Talk: IMS International Conference on Statistics and Data Science, Nice, France, December 2024.

[T43] Statistics Seminar, University of Waterloo, November 2024.

[T42] Statistics Seminar, University of Michigan, September 2024.

[T41] Invited Talk: International Symposia on Nonparametric Statistics, Braga, June 2024.

[T40] Invited Talk: New Perspectives on the Analysis of Complex Multivariate Data, Institute for Research in Statistics and its Applications, University of Minnesota, May 2024.

[T39] Statistics and Applied Probability Seminar, UC Santa Barbara, October 2023.

[T38] Invited Talk: Big Data and Machine Learning in Econometrics, Finance, and Statistics, University of Chicago, October 2023.

[T37] Invited Poster: The Joint Statistical Meetings, Toronto, August 2023.

[T36] Invited Talk: ICSA Applied Statistics Symposium, Ann Arbor, June 2023.

[T35] Biostatistics Seminar, University of Washington. May 2023.

[T34] Statistics Seminar, University of Pittsburg. April 2023.

[T33] Invited Talk: IISA Conference, Bangalore. December 2022.

[T32] Invited Talk: Computational and Methodological Statistics Seminar, London. December 2022.

[T31] Neyman Seminar, UC Berkeley. November 2022.

[T30] Statistics Seminar, KU Leuven. March 2022.

[T29] Statistics Seminar, University of Minnesota. November 2021.

[T28] Biostatistics Seminar, University of Michigan. October, 2021.

[T27] Invited Talk: International Seminar on Selective Inference. August 2021.

[T26] Biostatistics Seminar, University of Michigan. December, 2020.

[T25] Invited Talk: Joint Statistical Meetings, August 2020.

[T24] Invited Talk: International Symposium on Nonparametric Statistics, Paphos, June 2020 (Canceled due to Covid-19).

[T23] Invited Talk: The Statistical Learning and Data Science Conference, UC Irvine, May 2020 (Canceled due to Covid-19).

[T22] Invited Talk: The Interface Between Selective Inference and Machine Learning, Banff, March 2020. (Canceled due to Covid-19).

[T21] Statistics Seminar, Ohio State University, January 2020.

[T20] Invited Talk: Workshop on Higher-Order Asymptotics and Post-Selection Inference, Washington University, St. Louis. August 2019.

[T19] Invited Lecture: Big data summer institute, Michigan School of Public Health, July 2019.

[T18] Contributed Poster: New Researchers' Conference, Fort Collins, June 2019.

[T17] Statistics Seminar, Michigan State University , April 2019.

[T16] Invited Talk: Indian Institute of Science, Bangalore, March 2019.

[T15] Invited Talk: Indian Statistical Institute, Bangalore, March 2019.

[T14] Invited Talk: Indian Statistical Institute, Kolkata, March 2019.

[T13] Invited Talk: MIDAS, University of Michigan, November 2018.

[T12] Tutorial on Adaptive Data Analysis Workshop, Simons Institute for Theory of Computing, UC Berkeley, July 2018.

[T11] Statistics Seminar, CMU Statistics and Data Science, February 2018.

[T10] Statistics Seminar, University of Michigan, February 2018.

[T9] Department of Biostatistics, Harvard T.H. Chan School of Public Health, January 2018.

[T8] Statistics Seminar, Columbia University, January 2018.

[T7] Invited Talk: Workshop in Operations Research and Data Science, The Fuqua School of Business, Duke University, December 2017.

[T6] Invited Talk: Berkeley statistics and genomics seminar, October 2017.

[T5] Invited Talk: Workshop on Higher-Order Asymptotics and Post-Selection Inference, Washington University, St. Louis, August 2017.

[T4] Invited Talk: 10th International Conference on Multiple Comparison Procedures, UC Riverside, June 2017.

[T3] Contributed Poster: Workshop on Higher-Order Asymptotics and Post-Selection Inference, Washington University, St. Louis, September 2016.

[T2] Contributed Talk: Extreme Value Analysis Conference, University of Michigan, Ann Arbor, June 2015.

[T1] Contributed Talk: Workshop on Heavy Tailed Distributions and Extreme Value Theory, Indian Statistical Institute, Kolkata, January 2013.

Teaching

STATISTICS COURSES

Stats 415: Data Mining and Machine Learning. 2024, 2025, Winter and Fall. Upper-level undergraduate course.

Stats 600: Regression Analysis. 2020, 2022, 2023, 2024, 2025 Fall. Core PhD course.

Stats 280: Honors Introduction to Statistics & Data Analysis. 2018, 2019, 2020, 2022 Fall. Lower-level undergraduate course.

Stats 605: Advanced PhD Topics Course on Adaptive Data Analysis and Selective Inference. 2019, Winter. Advanced PhD course.

SUMMER TRAINING PROGRAM

Big Data Summer Institute (BDSI): 2023, 2024 Summer. Project Mentor and Instructor for "Data Mining and Machine Learning".

PhD Students

Graduated Students

[6] Yumeng Wang (Co-chaired with X. He); Graduated 2025.

[5] Peter W. MacDonald (Committee member); Graduated 2023.

[4] Daniel Kessler (Committee member); Graduated 2023.

[3] Natasha Stewart (Co-chaired with E. Levina); Left for industry with a Master's in 2022.

[2] Sanjana Gupta (Committee member); Graduated 2022.

[1] Qianhua Shan (Committee member); Graduated 2022.

Current Students

[4] Dhruba Nandi (Chair); Expected Graduation: 2029.

[3] Di (Judy) Wu (Chair); Expected Graduation: 2028.

[2] Soham Bakshi (Chair); Expected Graduation: 2027.

[1] Yiling Huang (Chair); Expected Graduation: 2027.

Undergraduate Students

URPS represents students mentored through the Undergraduate Research Program in Statistics, BDSI represents students mentored during the Big Data Summer Institute at the University of Michigan, and IND represents students who conducted independent study in Statistics.

[5] 2024-25: JinWook Lee (IND)

[4] 2023-24: Haiming Li (URPS) , Po-Tsun Chen (URPS), Yihan Yao (URPS), Yuezhou Qu (URPS), Corrine Liu (URPS), Rio Baliga (BDSI), Nicholas Della Pesca (BDSI), Peter Dunson (BDSI), Sophia Evangelista (BDSI), Ephrata Getachew (BDSI), Keanu Keopimpha (BDSI), Jack O'Connor (BDSI), Pranjal Rai (BDSI), Nate Stevenson (BDSI), Lucy Teed (BDSI), Monserrath Velez (BDSI)

[3] 2022-23: Hannah Daane (URPS), Peiran Wang (URPS, IND), Sanchayan Bhowal (BDSI), Billy Bratton (BDSI), Samprit Chakraborty (BDSI), Mackenzie Mueller (BDSI), Nicholas Rao (BDSI), Rosalie Daniels (BDSI), Thejasvi Dhanireddy (BDSI), Neo Kok (BDSI), Cynthia Liu (BDSI), Xiaohan Liu (BDSI), Caroline Moy (BDSI)

[2] 2021-22: Renee Jia Er Sew (URPS), Yiran Fan (URPS), Yiling Huang (IND)

[1] 2020-21: Tian Xie (URPS), Qiang Chen (URPS)

Other Advising

First Year PhD Student Mentoring

Abhiti Mishra, 2023-24, Zhiwei Xu 2022-23, Yichao Chen, 2021-22, Pramit Das, 2020–21, Natasha Stewart, 2019–20.

Master's Student Mentoring

Advised about 10 MAS (Master's in Applied Statistics) students per year towards degree completion: 2019-Present

Seminar/ Conference Organization

1. Workshop on Translational Research on Data Heterogeneity at Washington University, St. Louis. April 2024. Co-organizers: X. He, L. Wang, K. Kato, Q. Zheng.
2. Session in ICSA on Statistical Decision-making for Complex, Big Data at Ann Arbor, Michigan. June 2023. Organizers: J. Kang, G. Xu.
3. Quantile Regression and Data Heterogeneity Workshop at University of Miami, Florida. February 2022. Co-organizers: X. He, L. Wang, K. Kato, Q. Zheng.
4. Session in IISA on Causal Analysis: cutting edge applications and novel techniques at Mumbai, India. December 2019. Organizers: V. Baladandayuthapani.

Professional Service

EXTERNAL

Associate Editor for Bernoulli. 2025-Present.

Associate Editor for Journal of the Royal Statistical Society Series B (Statistical Methodology). 2025-Present.

Associate Editor for the Journal of Computational and Graphical Statistics. 2021-Present.

Refereed for: Annals of Statistics, Journal of the American Statistical Association, Journal of the Royal Statistical Society Series B, Electronic Journal of Statistics, Biometrika, Journal of Machine Learning Research, Journal of Computational and Graphical Statistics, Journal of Privacy and Confidentiality, Information and Inference, Annals of the Institute of Statistical Mathematics.

Grant review for: National Science Foundation, Dutch Research Council, Israel Science Foundation.

Other Professional Service

Referee for journals. Annals of Statistics, Journal of the American Statistical Association, Journal of the Royal Statistical Society Series B, Electronic Journal of Statistics, Biometrika, Journal of Machine Learning Research, Journal of Computational and Graphical Statistics, Journal of Privacy and Confidentiality, Information and Inference.

Undergraduate curricula development. Probability for Data Science, University of Michigan, 2019-2020.

Service as Teaching volunteer. the Schwab Learning Center, Stanford University, 2014-15 Summer.

Service as Consultant. Stanford Statistics Free Consulting Service, 2014-15.