CYNTHIA RUSH CURRICULUM VITAE

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EMPLOYMENT

- Associate Professor, Department of Statistics, Columbia University, July 2023 - Present.
  Affiliated Member of the Data Science Institute, Columbia University, January 2019 - Present.
  Research Associate at the American Museum of Natural History, June 2024 - Present.
- Howard Levene Assistant Professor, Department of Statistics, Columbia University, July 2020 - June 2023.
- Assistant Professor, Department of Statistics, Columbia University, July 2017 - June 2020.
- Term Assistant Professor, Department of Statistics, Columbia University, July 2016 - June 2017.

EDUCATION

Yale University — New Haven, CT
Ph.D. in Statistics — *May 2016*

Yale University — New Haven, CT
M.A. in Statistics — *December 2011*

University of North Carolina at Chapel Hill — Chapel Hill, NC
B.S. in Mathematics — *May 2010*

Ph.D. Dissertation Title: Iterative Algorithms for Inference and Optimization, with Applications in Communications and Compressed Sensing
Advised by: Andrew Barron

RESEARCH INTERESTS

- Information Theory and Communication Systems.
- Concentration Inequalities and Non-asymptotic Analysis.
- High-dimensional Statistics.
- Robust Statistics in Machine Learning.

GRANTS, FELLOWSHIPS, & ACAMDEIC HONORS

- Information Theory Society Goldsmith Lecturer, 2026.
- NSF DMS 2413828, Principal Investigator, September 2024 – August 2026, $117,910 funded, "Fundamental Limits of High-Dimensional Statistical Estimation".
- Provost's Grants Program for Junior Faculty who Contribute to the Diversity Goals of the University, "Machine Learning Methods for Robust Data Analysis", Spring 2022.
- Google Research Fellowship, Simons Institute for the Theory of Computing Program on Computational Complexity of Statistical Inference, Fall 2021.
- NSF CCF 1849883, Principal Investigator, July 2019 – May 2023, $153,597 funded, "Approximate Message Passing Algorithms for High-Dimensional Estimation".
- NTT Research Fellowship, Simons Institute for the Theory of Computing Program on Probability, Geometry, and Computation in High Dimensions, Fall 2020.
- IEEE Jack Keil Wolf ISIT Student Paper Award Finalist, July 2016.
- National Merit Scholar, 2006 - 2010.

PUBLICATIONS

1. G. Sopa, M. Avella Medina, C. Rush, "Differentially Private Inference for Longitudinal Linear Regression." Available online: https://arxiv.org/abs/2601.10626.
2. R. Ray, M. Avella Medina, C. Rush, "Statistical Guarantees for Data-driven Posterior Tempering." Available online: https://arxiv.org/abs/2601.09122.
3. J. Marusic, M. Avella Medina, C. Rush, "A theoretical framework for M-posteriors: frequentist guarantees and robustness properties." Available online: https://arxiv.org/abs/2510.01358.
4. Z. Bu, J. Klusowski, **C. Rush**, and R. Wu, "Sharp trade-offs in High-dimensional inference via 2-level SLOPE." Available online: https://arxiv.org/abs/2507.09110.
5. R. Han, **C. Rush**, and J. Wiesel, "Max-sliced Wasserstein concentration and uniform ratio bounds of empirical measures on RKHS," (forthcoming) *Bernoulli*. Available online: https://arxiv.org/abs/2405.13153.
6. J. Montiel Olea, **C. Rush**, A. Velez, and J. Wiesel, "The out-of-sample prediction error of the square-root-LASSO and related estimators," (forthcoming) *Annals of Statistics*. Available online: https://arxiv.org/abs/2211.07608.
7. J. Shah, M. Cardone, **C. Rush**, and A. Dytso, "Generalized Linear Models with 1-bit Measurements: Asymptotics of the Maximum Likelihood Estimator," *49th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2025.
8. C. Cademartori and **C. Rush**, "A non-asymptotic analysis of generalized vector approximate message passing algorithms with right rotationally invariant designs," *IEEE Transactions on Information Theory*, 2024. Available online: https://arxiv.org/abs/2302.00088.
9. Z. Bu, J. Klusowski, **C. Rush**, and W. Su, "Characterizing the SLOPE trade-off: a variational perspective and the Donoho-Tanner limit," *The Annals of Statistics*, 51.1 (2023): 33-61. Available online: https://arxiv.org/abs/2105.13302.
10. R. Ray, M. Avella Medina and **C. Rush**, "Asymptotics for power posterior mean estimation," *2023 59th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*. IEEE, 2023. Available online: https://arxiv.org/abs/2310.07900.
11. J. Shah, M. Cardone, A. Dytso and **C. Rush**, "When is mimo massive in radar?" *48th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2023.
12. **C. Rush**, F. Skerman, A. Wein and D. Yang, "Is it easier to count communities than find them?" *14th Innovations in Theoretical Computer Science (ITCS)*. LIPIcs, 2022. Available online: https://arxiv.org/abs/2212.10872.
13. A. Dytso, M. Cardone, and **C. Rush**, "Entropic central limit theorem for order statistics," *IEEE Transactions on Information Theory*, 69.4 (2022): 2193-2205. Available online: https://arxiv.org/abs/2205.04621.
    - A. Dytso, M. Cardone, and **C. Rush**, "Entropic CLT for order statistics," *2022 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2022.
14. H. Liu, **C. Rush**, and D. Baron, "Rigorous state evolution analysis for approximate message passing with side information," *IEEE Transactions on Information Theory*, 69.6 (2023): 3989-4013. Available online: https://arxiv.org/abs/2003.11964.
    - H. Liu, **C. Rush**, and D. Baron, "State evolution analysis of approximate message passing with side information," *2019 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2019.
15. K. Hsieh, **C. Rush**, and R. Venkataramanan, "Near-optimal coding for many-user multiple access channels," *IEEE Journal on Selected Areas in Information Theory*, 3.1 (2022): 21-36. Available online: https://arxiv.org/abs/2102.04730.
    - K. Hsieh, **C. Rush**, and R. Venkataramanan, "Near-optimal coding for massive multiple access," *2021 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2021.
16. O. Feng, R. Venkataramanan, **C. Rush**, and R. Samworth, "A unifying tutorial on approximate message passing," *Foundations and Trends in Machine Learning*, 15.4 (2022): 335-536. Available online: https://arxiv.org/abs/2105.02180.
17. M. Avella Medina, J. Montiel Olea, **C. Rush**, and A. Velez "On the robustness to misspecification of α-posteriors and their variational approximations," *The Journal of Machine Learning Research*, 23.147 (2022): 6579-6629. Available online: https://arxiv.org/abs/2105.02180.

18. J. Barbier, N. Macris, and **C. Rush**, "All-or-nothing statistical and computational phase transitions in sparse spiked matrix estimation," *Advances in Neural Information Processing Systems 33 (NeurIPS)*. 2020. Available online: `https://arxiv.org/abs/2006.07971`.

19. **C. Rush**, K. Hsieh, and R. Venkataramanan, "Capacity-achieving spatially coupled sparse superposition codes with AMP decoding," *IEEE Transactions on Information Theory*, 67.7 (2021): 4446-4484. Available online: `https://arxiv.org/abs/2002.07844`.

20. V. Amalladinne, A. Pradhan, **C. Rush**, J. Chamberland, and K. Narayanan "Unsourced random access with coded compressed sensing: integrating AMP and belief propagation," *IEEE Transactions on Information Theory*, 68.4 (2021): 2384–2409. Available online: `https://arxiv.org/abs/2010.04364`.

21. A. Dytso, M. Cardone, and **C. Rush**, "The most informative order statistic and its application to image denoising," *2021 55th Asilomar Conference on Signals, Systems, and Computers (Asilomar)*. IEEE, 2021. Available online: `https://arxiv.org/abs/2101.11667`.

22. B. Wexler, L. Vitulano, C. Moore, L. Katsovich, S. Smith, **C. Rush**, H. Grantz, J. Dong, J. Leckman, "An integrated program of computer-presented and physical brain-training exercises for children with attention-deficit/hyperactivity disorder," *Psychological Medicine*, 51.9 (2020): 1524-1535.

23. V. Amalladinne, A. Pradhan, **C. Rush**, J. Chamberland, and K. Narayanan "On approximate message passing for unsourced access with coded compressed sensing," *2020 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2020.

24. C. Cademartori and **C. Rush**, "Exponentially fast concentration of vector approximate message passing to its state evolution," *2020 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2020.

25. Z. Bu, J. Klusowski, **C. Rush**, and W. Su, "Algorithmic analysis and statistical estimation of SLOPE via approximate message passing," *IEEE Transactions on Information Theory*, 67.1 (2021): 506-537. Available online: `https://arxiv.org/abs/1907.07502`.

    - Z. Bu, J. Klusowski, **C. Rush**, and W. Su, "Algorithmic analysis and statistical estimation of SLOPE via approximate message passing," *Advances in Neural Information Processing Systems 32 (NeurIPS)*. 2019.

26. A. Dytso, M. Cardone, and **C. Rush**, "Measuring dependencies of order statistics: an information theoretic perspective," *2020 IEEE Information Theory Workshop (ITW)*. IEEE, 2021. Available online: `https://arxiv.org/abs/2009.12337`.

27. **C. Rush**, "An asymptotic rate for the LASSO loss," *International Conference on Artificial Intelligence and Statistics (AISTATS)*. PMLR, 2020.

28. D. Baron, **C. Rush**, and Y. Yapici, "mmWave channel estimation via approximate message passing with side information," *2020 IEEE 21st International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*. IEEE 2020. Available online: `https://arxiv.org/abs/2005.02244`.

29. Y. Ma, **C. Rush**, and D. Baron, "Analysis of approximate message passing with non-separable denoisers and markov random field priors," *IEEE Transactions on Information Theory*, 65.11 (2019): 7367-7389. Available online: `https://arxiv.org/abs/1705.03126`.

30. **C. Rush** and R. Venkataramanan, "The error probability of sparse superposition codes with approximate message passing decoding," *IEEE Transactions on Information Theory*, 65.5 (2019): 3278-3303. Available online: `https://arxiv.org/abs/1712.06866`.

    - **C. Rush** and R. Venkataramanan, "The error exponent of sparse regression codes with AMP decoding," *2017 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2017.

31. **C. Rush**, K. Hsieh, and R. Venkataramanan, "Spatially coupled sparse regression codes with sliding window AMP decoding," *2019 IEEE Information Theory Workshop (ITW)*. IEEE, 2019.

32. A. Ma, Y. Zhou, **C. Rush**, D. Baron, and D. Needell, "An approximate message passing framework for side information," *IEEE Transactions on Signal Processing*, 67.7 (2019): 1875-1888. Available online: `https://arxiv.org/abs/1807.04839`.

33. **C. Rush**, K. Hsieh, and R. Venkataramanan, "Capacity-achieving sparse regression codes via spatial coupling," *2018 IEEE Information Theory Workshop (ITW)*. IEEE, 2018.

34. K. Hsieh, **C. Rush**, and R. Venkataramanan, "Spatially coupled sparse regression codes: design and state evolution analysis," *2018 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2018. Available online: `https://arxiv.org/abs/1801.01796`.

35. **C. Rush** and R. Venkataramanan, "Finite sample analysis of approximate message passing," *IEEE Transactions on Information Theory*, 64.11 (2018): 7264-7286. Available online: `https://arxiv.org/abs/1606.01800`.

    - **C. Rush** and R. Venkataramanan, "Finite sample analysis of approximate message passing," *2016 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2016. (**JKW Student Paper Award Finalist, top 1% of papers**).

36. D. Baron, A. Ma, D. Needell, **C. Rush**, and T. Woolf, "Conditional approximate message passing with side information," *2017 51st Asilomar Conference on Signals, Systems, and Computers (Asilomar)*. IEEE, 2017.

37. Y. Ma, **C. Rush**, D. Baron, "Analysis of approximate message passing with a class of non-separable denoisers," *2017 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2017.

38. **C. Rush**, A. Greig, and R. Venkataramanan, "Capacity-achieving sparse superposition codes with approximate message passing decoding," *IEEE Transactions on Information Theory*, 63.3 (2017): 1476-1500. Available online: `https://arxiv.org/abs/1501.05892`.

    - **C. Rush**, A. Greig, and R. Venkataramanan, "Capacity-achieving sparse regression codes with approximate message passing decoding," *2015 IEEE International Symposium on Information Theory (ISIT)*. IEEE, 2015.

39. B. Wexler, M. Iselli, S. Leon, W. Zaggle, **C. Rush**, A. Goodman, and E. Ahmet, "Cognitive priming and cognitive training: immediate and far transfer to academic skills in children," *Scientific Reports*, 6.1 (2016): 32859. Available online: `nature.com/articles/srep32859`. Press: `NPR`, `Yale News`, `WTNH`.

40. **C. Rush** and A. Barron, "The method of nearby measures," *2013 Workshop on Information Theoretic Methods in Science and Engineering (WITMSE)*. 2013.

41. G. Carter, **C. Rush**, F. Uygun, N. Sakhanenko, D. Galas, and T. Galitski, "A systems-biology approach to modular genetic complexity," *Chaos*, 20.2 (2010): 026102. Available online: `http://www.ncbi.nlm.nih.gov/pmc`.

INVITED TALKS

2026

- Statistical Learning and Data Science (SLDS) 2026 Conference, New York, NY, November 2026.
- Mathematical Statistics in the Information Age, Bochum, Germany, October 2026.
- Machine Learning in Nonstandard Settings, Fréjus, France, September 2026.
- International Conference on Robust Statistics 2026, Istanbul, Turkey, July 2026.
- IMS Annual Meeting 2026, Salzburg, Austria, July 2026.
- Statistics Seminar at Universitat Pompeu Fabra (UPF), Barcelona, Spain, April 2026.
- The XVII Latin American Congress of Probability and Mathematical Statistics (CLAPEM), Montevideo, Uruguay, March 2026.
- Uppsala University, Probability and Combinatorics Seminar, Uppsala, Sweden, February 2026.

2025

- Colombia Statistics and Data Science Workshop, Bogotá, Colombia, December 2025.
- Brin Mathematics Research Center Maryland Statistics Symposium, College Park, MD, December 2025.
- 2025 Data-driven Techniques in Operations Research Workshop, Shenzhen, China, November 2025.
- University of Illinois Urbana Champaign, Statistics Seminar, Urbana-Champaign, IL, September 2023.
- The 62nd Allerton Conference on Communication, Control, and Computing, Urbana-Chapaign, IL, September 2023.
- Workshop on Information-Computation Tradeoffs for Statistical Tasks: New Challenges and Opportunities at TTIC, Chicago, IL, June 2025.
- The 38th New England Statistics Symposium, New Haven, Connecticut, June 2025.
- 2025 IISA Conference, Lincoln, Nebraska, June 2025.
- 2025 INFORMS Applied Probability Society Conference, Atlanta, GA, June 2025.
- Applied Probability Summer School, Atlanta, GA, June 2025.

- Georgia Tech, Department of Mathematics, Probability Seminar, February 2025.
- 2025 Statistics Empowering Data Science (SEEDS) Conference, Los Angeles, CA, January 2025.

2024

- 2024 IISA Conference, Kochi, India, December 2024.
- IMS International Conference on Statistics and Data Science (ICSDS), Nice, Franca, December 2024.
- Princeton University, Distinguished Lecture, Princeton, NJ, December 2024.
- AIM Workshop on "Low-degree polynomial methods in average-case complexity", Pasadena, CA, December 2024.
- Thematic School: Optimization & Algorithms for High-dimensional Machine Learning and Inference, Toulouse, France, October 2024.
- LMCRC Mathematical & Information Science Summit, Paris, France, September 2024.
- International Conference on Soft Methods in Probability and Statistics, Salzburg, Austria, September 2024.
- 25th International Symposium on Mathematical Programming, Montreal, Canada, July 2024.
- Workshop on Randomness and Learning on Networks, Rio de Janeiro, Brazil, July 2024.
- JTG/IEEE IT Society Summer School, Bangalore, India, July 2024.
- International Conference on Signal Processing and Communications (SPCOM), Hyderabad, India, June 2024.
- International Symposium on Mathematical Programming, Montreal, Canada, July 2024.
- KTH Stochastic Networks Conference, Stockholm, Sweden, July 2024.
- Forty Years at the Interplay of Information Theory, Probability and Statistical Learning at Yale University, New Haven, CT, April 2024.
- Columbia University, Department of Statistics, Student Seminar, April 2024.
- EnCORE Workshop on Computational vs Statistical Gaps in Learning and Optimization, Los Angeles, CA, March 2024.
- Learning and Information Theory Workshop at EPFL, Laussane, Switzerland, March 2024.
- 2024 International Zurich Seminar on Information and Communication, Zurich, Switzerland, March 2024.

2023

- IMS International Conference on Statistics and Data Science (ICSDS), Lisbon, Portugal, December 2023.
- Princeton Statistics Days, Princeton, NJ, November 2023.
- Cornell University, Statistics Seminar, Ithaca, NY, November 2023.
- Yale University, Statistics Seminar, New Haven, CT, October 2023.
- Uppsala University, Probability and Combinatorics Seminar, Uppsala, Sweden, October 2023.
- 2023 INFORMS Annual Meeting, Phoenix, AZ, October 2023.
- Fifty-Ninth Annual Allerton Conference on Communication, Control, and Computing, Urbana-Chapaign, IL, September 2023.
- International Council for Industrial and Applied Mathematics Congress (ICIAM) 2023, Tokyo, Japan, August 2023.
- Hangzhou International Conference on Frontiers of Data Science, Hongzhou, August 2023.
- Joint Statistical Meetings, Toronto, Canada, August 2023.
- Statistical Physics and Machine Learning Back Together, Cargese, France, July 2023.
- The XVI Latin American Congress of Probability and Mathematical Statistics (CLAPEM), Sao Paulo, Brazil, July 2023.
- Simons Institute Workshop on Information Theoretic Methods for Secure, Reliable and Rigorous Machine Learning, Berkeley, CA, May 2023.
- NYU Mathematics and Data Science Seminar, New York, NY, February 2023.
- NUS Information Theory and Data Science Workshop, Singapore, January 2023.

2022

- 2022 IISA Conference, Bengaluru, India, Dec. 2022.

- Boston University, Probability and Statistics Seminar, Boston, MA, November 2022.
- IPAM Workshop on Multi-Modal Imaging with Deep Learning and Modeling, Los Angeles, CA, November 2022.
- 2022 INFORMS Annual Meeting, Indianapolis, IN, October 2022.
- 2022 SIAM Conference on the Mathematics of Data Science, San Diego, CA, Oct. 2022.
- University of Illinois Urbana Champaign, Statistics Seminar, Urbana-Champaign, IL, October 2022.
- Rutgers University, Signal and Information Processing (SIP) Seminar, New Brunswick, NJ, October 2022.
- University of Wisconsin, Statistics Seminar, Madison, WI, September 2022.
- International Conference on Continuous Optimization (ICCOPT), Bethlehem, PA, July 2022.
- Harvard Radcliffe Institute Workshop on Exploring and Exploiting High-dimensional Phenomena in Statistical Learning and Inference, Cambridge, MA, June 2022.
- UIC Tripods mini-workshop on Probability, Inference, and Algorithms, Chicago, IL, May 2022.
- 2022 Information Theory and Applications Workshop, San Diego, CA, May 2022.
- Lehigh University-Northwestern University-University of Minnesota Joint Probability Seminar, April 2022.
- University of Pennsylvania, Statistics Seminar, Philadelphia, PA, April 2022.
- Columbia University, Department of Statistics, Student Seminar, April 2022.
- Conference on Information Sciences and Systems, Princeton, NJ, March 2022.
- International Zurich Seminar on Information and Communication, Zurich, Switzerland, March 2022.
- Duke Statistics Seminar, Durham, NC, March 2022.
- Google Research, Algorithms Seminar, February 2022.
- FOCS 2021, Workshop on Recent Directions in Machine Learning, Denver, CO, February 2022.

2021

- 14th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, England, December 2021.
- International Seminar on Selective Inference, Berkeley, CA, November 2021.
- BIRS Workshop, "Mathematical Statistics and Learning", Calgary, Alberta, CA, November 2021.
- EU-US Frontiers of Engineering Symposium, virtual, November 2021.
- MIT, Stochastics and Statistics Seminar, Cambridge, MA, November 2021.
- Texas A&M University, Department of Statistics Seminar, College Station, TX, November 2021.
- Stanford University, Statistics Seminar, Cambridge, MA, September 2021.
- Meet the Fellows Workshop, Simons Institute, Berkeley, CA, September 2021.
- Simons Institute for the Theory of Computing Workshop on Rigorous Evidence for Information-Computation Trade-offs, Berkeley, CA, August 2021.
- Program on Computational Complexity of Statistical Inference Bootcamp, Simons Institute, Berkeley, CA, August 2021.
- COLT 2021 Planned Mentorship Workshop, Learning Theory Alliance, Boulder, CO, August 2021.
- Two Sigma PhD Research Symposium, New York, NY, July 2021.
- Youth in High-Dimensions Workshop, International Centre for Theoretical Physics, Trieste, Italy, June 2021.
- Harvard University, Probability Seminar, Cambridge, Massachusetts, April 2021.
- Young Statisticians Meet: Data Science in Action, Kolkata, India, March 2021.
- Conference on Information Sciences and Systems, Baltimore, Maryland, March 2021.

2020

- Washington University in St. Louis, Department of Electrical and Systems Engineering Seminar, October 2020.
- Simons Institute for the Theory of Computing Program on Probability, Geometry, and Computation in High Dimensions, Fellows Talk, September 2020.
- International Symposium on Nonparametric Statistics, Paphos, Cyprus, Greece, June 2020. (postponed)

- Conference on Statistical Learning and Data Science, Irvine, California, May 2020. (cancelled)
- IEEE International Workshop on Signal Processing Advances in Wireless Communications, Atlanta, Ga, May 2020.
- AT&T Bell Labs, Statistics Seminar, New Jersey, April 2020. (cancelled)
- Conference on Information Sciences and Systems, Princeton, New Jersey, March 2020. (cancelled)
- 2020 Information Theory and Applications Workshop, San Diego, CA, February 2020.
- 3rd Berkeley-Columbia Meeting in Engineering and Statistics, Berkeley, California, February 2020.
- University of Washington, Department of Statistics Seminar, February 2020.
- Information Theory and Applications Workshop, San Diego, California, February 2020.
- International Centre for Theoretical Sciences Statistical Physics and Machine Learning Workshop, Bangalore, India, January 2020.

2019

- The XV Latin American Congress of Probability and Mathematical Statistics (CLAPEM), Merida-Yucatan, Mexico, December 2019.
- The 2nd Annual Meeting of the SIAM Texas Louisiana Section, November 2019.
- Texas A&M University, Department of Electrical & Computer Engineering Seminar, October 2019.
- Columbia University, Department of Statistics, Student Seminar, September 2019.
- Information Theory Workshop, Gotland, Sweden, August 2019.
- Workshop on Higher-Order Asymptotics and Post-Selection Inference, St. Louis, Missouri, August 2019.
- IMS China International Conference on Statistics and Probability, Dalian, China, July 2019.
- London Symposium on Information Theory, May 2019.
- The 33^{rd} New England Statistics Symposium, Hartford, Connecticut, May 2019.
- ICERM Workshop on Optimization Methods in Computer Vision and Image Processing, April 2019.
- Columbia University, Department of Industrial Engineering and Operations Research, Applied Probability and Risk Seminar, April 2019.
- Information Theory and Applications Workshop, San Diego, California, February 2019.

2018

- Information Theory Workshop, Guangzhou, China, December 2018.
- Statistics Seminar, Hong Kong University of Science and Technology, December 2018.
- International Conference on Big Data and Information Analytics, Houston, Texas, December 2018.
- International Symposium on Turbo Codes & Iterative Information Processing, November 2018.
- Pattern Theory Group, Division of Applied Mathematics, Brown University, October, 2018.
- Statistical Physics and Machine Learning Back Together, Cargese, France, August 2018.
- IMS Asia Pacific Rim Meeting, June 2018.
- 2nd Berkeley-Columbia Meeting in Engineering and Statistics, April 2018.
- Vanderbilt University, Department of Biostatistics Seminar Series, April 2018.
- AT&T NYC Machine Learning Seminar Series, February 2018.

2017

- International Indian Statistical Association International Conference on Statistics, Hyderabad, India, December 2017.
- Harvard University, Department of Statistics, Colloquium, November 2017.
- Rutgers University, Department of Statistics, Statistics Seminar, October 2017.
- Columbia University, Department of Statistics, Student Seminar, October 2017.
- American Institute of Math, Entropy Power Inequalities Workshop, April 2017.

2016 and before

- University of Illinois, Urbana-Champaign, Coordinated Science Laboratory, Colloquium, October 2016.
- Yale University, Department of Biostatistics, Colloquium, September 2016.

- Columbia University, Department of Statistics, Colloquium, March 2016.
- University of California, Los Angeles, Department of Mathematics and Department of Statistics, Colloquium, February 2016.
- Carnegie Mellon University, Department of Statistics, Colloquium, February 2016.
- University of Florida, Department of Statistics, Colloquium, January 2016.
- University of Virginia, Department of Statistics, Colloquium, January 2016.
- Williams College, Department of Mathematics and Statistics, Colloquium, December 2015.

PROFESSIONAL SERVICE

- Associate Editor for Journal of the Royal Statistics Society-B, 2026 - present.
- Associate Editor for Bernoulli, 2025 - present.
- Associate Editor for the Transactions on Information Theory, 2024 - present.
- Reviewer for:

  Journals: Annals of Applied Probability, Annals of Statistics, Applied Mathematics and Computation, Bayesian Analysis, Bernoulli, Biometrika, Foundations and Trends on Machine Learning, IEEE Transactions on Communications, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, Information and Inference, Journal of Machine Learning Research, Journal of the Royal Statistics Society-B, Science Advances, Sensors, SIAM Journal on Mathematical Analysis, SIAM Journal on Mathematics of Data Science, Statistical Analysis and Data Mining.

  Conference Proceedings: AISTATS, AWM/Springer Volume for the Proceedings of the Women in Data Science and Mathematics Workshop, Conference on Learning Theory, IEEE International Symposium of Information Theory, IEEE Information Theory Workshop, International Conference on Learning Research, International Conference on Machine Learning, International Joint Conference on Artificial Intelligence, NeurIPS, RANDOM, Women in Machine Learning Workshop.

  Grant Applications: U.S. National Science Foundation, Canadian Statistical Sciences Institute, Swiss National Science Foundation, National Science Centre Poland, Research Grants Council of Hong Kong.
- Editor of the Springer Festschrift value "Information Theory, Probability and Statistical Learning: A Festschrift in Honor of Andrew Barron".
- Invited Short Course at the Thematic Trimester: "Beyond classical regimes in statistical inference and machine learning", Toulouse, France, 2024.
- Invited Short Course at the Joint Telematics Group and Information Theory Society Summer School, Hyderabad, India, 2024.
- Organizer, Forty Years at the Interplay of Information Theory, Probability and Statistical Learning at Yale University, April 2024.
- Organizer, Algorithmic Structures for Uncoordinated Communications and Statistical Inference in Exceedingly Large Spaces, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), March 2024.
- Invited Tutorial on Approximate Message Passing at the North Atlantic School of Information Theory 2023, Philadelphia, PA, 2023.
- Member, Technical Program Committee, International Symposium on Topics in Coding, Brest, France, 2023.
- Technical Area Chair, Adaptive Systems, Machine Learning, Data Analytics track at the Asilomar Conference on Signals, Systems, and Computers, Asilomar 2022.
- Area Chair, Conference on Learning Theory, London, UK, 2022.
- Program Committee Member, The International Conference on Randomization and Computation (RANDOM), September 2022 and September 2023.
- Learning Theory Alliance (Let-All) graduate application support program mentor prioritizing students from underserved communities 2022.
- Founding member, Columbia Statistics Department Diversity, Equity, and Inclusion Committee (September 2020-present).
- Invited Talk on "How to Apply for Academic Jobs" at the Conference on Learning Theory 2021 hosted by with the Learning Theory Alliance.

- Organizer, ICML 2021 Workshop on Information-Theoretic Methods for Reliable, Responsible, and Rigorous Machine Learning (ITR3).
- Member, Junior Faculty Advisory Board, Columbia University, May 2021 - Present.
- Member, Technical Program Committee, International Symposium on Topics in Coding, Montreal, Canada, 2021.
- Area Chair, Conference on Learning Theory, Boulder, Colorado, 2021.
- Organizer, Predicting and Explaining Statistical-Computational Gaps reading group for Simons Institute for the Theory of Computing, September 2020.
- Technical Program Committee, 11th International Symposium on Topics in Coding (ISTC), Montreal, Canada, September, 2020.
- Member of the 2019-2020, 2020-2021 ASA Statistical Learning and Data Science Student Paper Award Committee, January, 2020 & 2021.
- Organizer for Columbia University Statistical Machine Learning Theme Year, May 2019 - May 2020.
- Member of the ASA Section on Learning and Data Science Student Paper Award Committee, 2020.
- Faculty Mentor in Student Outreach/Mentoring event on Young Faculty Career Advice at the International Symposium on Information Theory, 2019 and 2021.
- Panelist at the Graduate Research Symposium hosted by Women in Science at Columbia.
- Organizer for "Information Theoretic Methods in Machine Learning" panel at Conference on Information Sciences and Systems, Johns Hopkins University, March, 2018.
- Columbia Statistics Seminar Organizer, September 2016 - May 2018.
- Statistical Learning Research Roundtable Mentor, Finding and Academic Job Roundtable Mentor, Women in Machine Learning Workshop, December 2016, December 2019.
- Graduate Affiliate, Saybrook College, September 2015 - May 2016.
- Vice President, Graduate and Professional Student Senate, May 2015 - May 2016.

TEACHING

- Theoretical Statistics II, GR6202, Columbia University, Spring 2023, Spring 2024, Spring 2025.
- Theoretical Statistics I, GR6201, Columbia University, Fall 2022, Fall 2023, Fall 2024.
- Information Theory and High-Dimensional Statistics, GR8201, Columbia University, Spring 2022.
- Multivariate Statistical Inference, GR5332, Columbia University, Spring 2021.
- Statistical Modeling and Data Analysis II, GR6102, Columbia University, Spring 2019, Spring 2020.
- Statistical Modeling and Data Analysis I, GR6101, Columbia University, Fall 2018, Fall 2019.
- Applied Data Science, GU4243, Columbia University, Spring 2018.
- Statistical Computing and Intro. Data Science, GR5206, Columbia University, Fall 2016, 2017.
- Statistical Machine Learning, GR4241, Columbia University, Spring 2017.

STUDENTS

Postdoctoral Students.

- **Lekshmi Ramesh.** Postdoc Advisor. January 2023 - present.

PhD Students.

- **Collin Cademartori.** Thesis Advisor. *Current position*: Assistant Professor, Wake Forest University.
- **Ruchira Ray.** PhD Mentor Current.

MA Students.

- **César Eduardo Montiel Olea**. QMSS '17. Thesis Advisor. *Thesis*: "An Unsupervised Learning Approach to Address Crime in Mexico, 2012 – 2016". *Current position*: Inter-American Development Bank.

- **Yuming Zhang.** Statistics '17. Research Mentor. *Project*: "A Finite Sample Perspective on the LASSO Risk."

Undergraduate Students.

- **Ekene Ezeunala**. Undergraduate Mentored Research Advisor Spring 2023. *Project*: "Exact High-dimensional Asymptotics for Distributionally Robust Linear Prediction".
- **Gilead Turok**. Undergraduate Mentored Research Advisor Summer, Fall 2021. *Project*: "Statistical Robustness in Variation Inference".

UNIVERSITY SERVICE

- Junior Faculty Advisory Board; 2020 - 2022.

DEPARTMENT SERVICE

- Department Vision Committee Member. 2022-2024.
- Tenure-track Search Committee Member. 2018-2019; 2019-2020; 2023-2024.
- Theoretical Exams Committee Chair. 2023-2024, 2024-2025.
- Distinguished Postdoc Search Committee Member. 2022-2023.
- Diversity, Equity, and Inclusion Committee Member. 2020-2021; 2021-2022.
- PhD Admissions Interviewer. 2019-2020, 2024-2025.
- Applied Exams Committee Chair. 2018-2019; 2019-2020.
- PhD Admissions Committee Member. 2017-2018; 2018-2019; 2021-2022, 2024-2025.
- Statistics Department Seminar Organizer. 2016-2017; 2017-2018; 2024-2025.

PHD DEFENSE COMMITTEES

- **Yian Huang.** Internal Committee Member December 2025. *Thesis:* "Topics on Robust and Efficient Statistical Learning".
- **Ari Blau.** Dissertation Committee Chair June 2025. *Thesis:* "Reducing Label Dependence in Animal Behavior Modeling: Diverse Supervision Strategies for Improved Generalization".
- **Leon Fernandes.** Internal Committee Member September 2024. *Thesis:* "Application of Distance Covariance to Time Series Modeling and Assessing Goodness-of-Fit".
- **Collin Cademartori.** PhD Advisor June 2024. *Thesis:* "Trade-Offs and Opportunities in High-Dimensional Bayesian Modeling".
- **Gan Yuan.** Internal Committee Member April 2024. *Thesis:* "Topics on Machine Learning under Imperfect Supervision".
- **Yilin Guo.** Dissertation Committee Chair September 2023. *Thesis:* "Signal-to-noise ratio aware minimaxity and its asymptotic expansion".
- **Arnab Auddy.** Internal Committee Member May 2023. *Thesis:* "Statistical Benefits and Computational Challenges of Orthogonally Decomposable Tensors.
- **Kevin Kogler.** IST Austria External Committee Member Current.
- **Alejandra Quintos.** Internal Committee Member July 2022. *Thesis:* "Modeling Random Events".
- **Elliot Gordon Rodriguez.** Internal Committee Member March 2021. *Thesis:* "Advances in Machine Learning with Compositional Data".
- **Chaoyu Yuan.** Internal Committee Member August 2021. *Thesis:* "Event History Analysis in Multivariate Longitudinal Data".
- **Rishabh Dudeja.** Dissertation Committee Chair June 2021. *Thesis:* "High-dimensional Asymptotics for Phase Retrieval with Structured Sensing Matrices".
- **Milad Bakhshizadeh.** Internal Committee Member June 2021. *Thesis:* "Phase Retrieval in the High-dimensional Regime".

- **Tong Li.** Internal Committee Member December 2020. *Thesis:* "On the Construction of Minimax Optimal Nonparametric Tests with Kernel Embedding Methods".
- **Shuaiwen Wang.** Internal Committee Member June 2019. *Thesis:* "High-dimensional asymptotics: new insights and methods".
- **Morgane Austern.** Internal Committee Member April 2019. *Thesis:* "Limit theorems beyond sums of I.I.D. observations."
- **Wenda Zhou.** Oral Exam Committee Member. *Thesis:* "New Perspectives in Cross-Validation".
- **Yanting Ma.** North Carolina State University External Committee Member October 2017. *Thesis:* "Solving Large-Scale Inverse Problems via Approximate Message Passing and Optimization".