LINXI LIU: CURRICULUM VITAE

Last updated: June 1, 2025

Address

Department of Statistics
University of Pittsburgh
Email: linxi_liu@pitt.edu

Wesley W. Posvar Hall
230 S Bouquet Street
Pittsburgh, PA 15260

Research Interests

Nonparametric Statistics, Multiple Hypothesis Testing, Bayesian Statistics, Statistical Machine Learning, and Statistical Genetics

Education

2010—2016	Stanford University, Stanford, CA Ph.D. in Statistics Advisor: Prof. Wing Hung Wong
2006—2010	Tsinghua University, Beijing, China B.S. in Mathematics and Physics Minor in Economics

Employment

2020—present	Assistant Professor, Department of Statistics, University of Pittsburgh
2016—2020	Term-Assistant Professor, Department of Statistics, Columbia University
2015—2016	Research Assistant, Department of Statistics, Stanford University
2011—2015	Teaching Assistant, Department of Statistics, Stanford University

Publications (* indicates student advisee)

Peer-Reviewed Publications

1. **Liu, L.** and Ma, L. Spatial properties of Bayesian unsupervised trees. *Proceedings of Thirty Seventh Conference on Learning Theory (COLT)*, PMLR 247: 3556-3581, 2024.

2. Feng, H., Lu, XJ., Maji, S., **Liu, L.**, Ustianenko, D., Rudnick, N. D. and Zhang, C. Structure-based prediction and characterization of photo-crosslinking in native protein-RNA complexes. *Nature Communications*, 15(1): 2279, 2024.

3. Yang, Z., Wang, C., **Liu, L.**, Khan, A., Lee, A., Vardarajan, B., Mayeux, R., Kiryluk, K. and Ionita-Laza, I. CARMA is a new Bayesian model for fine-mapping in genome-wide association meta-analyses. *Nature Genetics*, 55(6): 1057-1065, 2023.

4. **Liu, L.**, Li, D. and Wong, W. H. Convergence rates of a class of multivariate density estimation methods based on adaptive partitioning. *Journal of Machine Learning Research*, 24(50): 1-64, 2023.

5. Ma, S., Wang, C., Khan, A., **Liu, L.**, Dalgleish, J., Kiryluk, K., He, Z. and Ionita-Laza, I. BIGKnock: fine-mapping gene-based associations via knockoff analysis of biobank-scale data. *Genome Biology*, 24(1): 24, 2023.

6. He, Z., **Liu, L.**, Belloy, M. E., Le Guen, Y., Sossin, A., Liu, X., Qi, X., Ma, S., Wyss-Coray, T., Tang, H., Sabatti, C., Candès, E., Greicius, M. and Ionita-Laza, I. GhostKnockoff inference empowers identification of putative causal variants in genome-wide association studies. *Nature Communications*, 13(1): 7209, 2022.

7. **Liu, L.**, Meng, Y., Wu, X., Ying, Z. and Zheng, T. Log-rank-type tests for equality of distributions in high-dimensional spaces. *Journal of Computational and Graphical Statistics*, 31(4): 1384-1396, 2022.

8. Yang, Y., Wang, C., **Liu, L.**, Buxbaum, J., He, Z. and Ionita-Laza, I. KnockoffTrio: A knockoff framework for the identification of putative causal variants in genome-wide association studies with trio design. *The American Journal of Human Genetics*, 109(10): 1761-1776, 2022.

9. He, Z., Le Guen, Y., **Liu, L.**, Lee, J., Ma, S., Yang, A. C., Liu, X., Rutledge, J., Losada, P. M., Song, B., Belloy, M. E., Butler, R. R., Longo, F. M., Tang, H., Mormino, E. C., Wyss-Coray, T., Greicius, M. and Ionita-Laza, I. Genome-wide analysis of common and rare variants via multiple knockoffs at biobank scale, with an application to Alzheimer disease genetics. *The American Journal of Human Genetics*, 108(12): 2336-2353, 2021.

10. Ma, S., Dalgleish, J., Lee, J., Wang, C., **Liu, L.**, Gill, R., Buxbaum, J. D., Chung, W. K., Aschard, H., Silverman, E. K., Cho, M. H., He, Z. and Ionita-Laza, I. Powerful gene-based testing by integrating long-range chromatin interactions and knockoff genotypes. *Proceedings of the National Academy of Sciences USA*, 118(47): e2105191118, 2021.

11. He, Z., **Liu, L.**, Wang, C., Le Guen, Y., Lee, J., Gogarten, S., Lu, F., Montgomery, S., Tang, H., Silverman, E., Cho, M., Greicius, M. and Ionita-Laza, I. Identification of putative causal loci in whole-genome sequencing data via knockoff statistics. *Nature Communications*, 12(1): 3152, 2021.

12. He, Z., **Liu, L.**, Wang, K. and Ionita-laza, I. A semi-supervised approach for predicting cell-type specific functional consequences of non-coding variation using MPRAs. *Nature Communications*, 9(1): 5199, 2018.

13. **Liu, L.**, Li, D. and Wong, W. H. Convergence rates of a partition based Bayesian multivariate density estimation method. *Advances in Neural Information Processing Systems (NIPS)* 30: 4738-4746, 2017.

14. Monajemi, H., Jafarpour, S., Gavish, M., Stat 330/CME 362 Collaboration and Donoho, D. L. Deterministic matrices matching the compressed sensing phase transitions of Gaussian random matrices. *Proceedings of the National Academy of Sciences USA*, 110(4): 1181-1186, 2012.

15. Ye, C., **Liu, L.**, Wang, X. and Zhang X. Observations on potential novel transcripts from RNA-Seq data. *Frontiers of Electrical and Electronic Engineering in China*, 6(2): 275-282, 2011.

Preprints

16. Yi, L.*, Lee, H.*, He, Z. and **Liu, L.** LaCIS-DA: A novel differential analysis method for single-cell RNA sequencing. Under review.

17. **Liu, L.** and Ma, L. On forest-type tree ensemble approaches to density learning under a generalized Bayesian framework. Under review.

18. He, Z., Chu, B., Yang, J., Gu, J., Chen, Z., **Liu, L.**, Morrison, T., Belloy, M. E., Qi, X., Hejazi, N., Mathur, M., Le Guen, Y., Tang, H., Hastie, T., Ionita-Laza, I., Sabatti, C. and Candès, E. Beyond guilty by association at scale: searching for causal variants on the basis of genome-wide summary statistics. Under review. The manuscript is available at bioRxiv: https://doi.org/10.1101/2024.02.28.582621.

19. **Liu, L.** and Lo, S. Measuring variable importance in classification problems based on nearest neighbors. Under review.

20. **Liu, L.**, He, Z. and Ionita-laza, I. A knockoff filter for probit and logistic regression models with Bayesian variable selection statistics. Under review.

Technical Report

21. Su, W., Qian, J. and **Liu, L.** Communication-efficient false discovery rate control via knockoff aggregation. arXiv:1506.05446, 2015.

Teaching Experience

As the Instructor at the University of Pittsburgh

Spring 2025	STAT 1632/2640 Intermediate Statistics
Spring 2024, Spring 2025	STAT 1961 Data Science Capstone
Fall 2023	STAT 2131 Applied Statistical Methods
Spring 2023	STAT 3691 Topics in Advanced Statistics I
Spring 2021, Spring 2022, Fall 2022, Fall 2024	STAT 2301 Statistical Computing and Intro to Data Science
Fall 2020, Fall 2021	STAT 1631/2630 Intermediate Probability

As the Instructor at Columbia University

Fall 2019	GR5205 Linear Regression Models
Fall 2016, Spring 2017 Spring 2018, 2019, 2020	GU4241/GR5241 Statistical Machine Learning
Fall 2018	GR5206 Statistical Computing and Intro to Data Science
Fall 2017	GR5705 Intro to Data Science

Mentoring

Doctoral Theses Supervised

2024	Lixia Yi, Department of Statistics, University of Pittsburgh (co-advised with Lucas Mentch) *Thesis title: Identification of differentially expressed genes via knockoff statistics in single-cell RNA sequencing data analysis.*

Current	Hyunjae Lee, Department of Statistics, University of Pittsburgh
Current	Junbo Zhang, Department of Statistics, University of Pittsburgh

Master's Advisee

2017	Wanting Wang, Quantitative Methods in the Social Sciences, Columbia University *Thesis title: Intergroup friendship as a protective factor against anti-muslim prejudice after terrorism attack: an analysis on Twitter data*
2020	Yang Meng, Department of Statistics, Columbia University

Dissertation Committees

Current	Fan Yang, Department of Statistics, University of Pittsburgh
Current	Jiaxuan Duan, Department of Statistics, University of Pittsburgh
Current	Zi Wang, Department of Statistics, University of Pittsburgh
Current	Weiqiong Huang, Department of Statistics, University of Pittsburgh
2017	Ruma Basu, Department of Statistics, Columbia University

Conference Presentations and Invited Talks

Aug 2025	8th International Conference on Econometrics and Statistics (EcoSta 2025), Tokyo, Japan
June 2025	14th International Conference on Bayesian Nonparametrics, Los Angeles, California (Contributed Talk)
June 2025	ICSA Applied Statistics Symposium, Storrs, Connecticut
Oct 2024	Statistics Seminar, Department of Applied & Computational Mathematics and Statistics, University of Notre Dame
Oct 2024	Keystone State Statistics Symposium, Pittsburgh, PA
Aug 2024	2024 Joint Statistical Meeting, Portland, Oregon
July 2024	7th International Conference on Econometrics and Statistics (EcoSta 2024), Beijing, China
July 2024	2024 ISBA World Meeting, Venice, Italy
June 2024	37th Annual Conference on Learning Theory, Edmonton, Canada
June 2024	ICSA Applied Statistics Symposium, Nashville, Tennessee
June 2024	Western North American Region of IBS Annual Meeting, Denver, Colorado
Mar 2024	Statistics Seminar, Department of Statistical Science, Duke University
Dec 2023	International Conference on Statistical Data Sciences, Lisbon, Portugal

Oct 2023	Keystone State Statistics Symposium, State College, PA
May 2023	Statistics Seminar, Department of Statistics, University of California, Riverside
Mar 2023	Statistics Seminar, Department of Mathematics & Statistics, Auburn University
July 2022	2022 ICSA China (Virtual)
June 2022	Deep Learning for Genetics, Genomics and Metagenomics: Latest Developments and New Directions, Banff International Research Station, Canada
Feb 2021	Department of Biostatistics, University of Pittsburgh (Virtual)
May 2019	2019 Symposium on Data Science & Statistics, Seattle
Feb 2019	Student Seminar, Department of Statistics, Columbia University
Dec 2018	10th Conference of the Eastern Mediterranean Region of the International Biometrics Society, Jerusalem, Israel (Contributed Talk)
July 2018	The 3rd Eastern Asia Meeting on Bayesian Statistics, Seoul, Korea
Apr 2018	Statistics Seminar, Department of Statistics, Columbia University
June 2017	2017 IMS-China International Conference on Statistics and Probability, Nanning, China
Aug 2015	2015 Joint Statistical Meeting, Seattle (Contributed Talk)
July 2015	Department of Biomedical Engineering, HKUST
June 2015	10th conference on Bayesian Nonparametrics, Raleigh, NC (Contributed Talk)
Aug 2014	Workshop on Probability & Related Topics, Mathematical Science Center, Tsinghua University, China