Robin Liu

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Education

University of California, Santa Barbara, Ph.D. in Statistics 2026 (*expected*)

- *Thesis* – Covariate-adjusted error structures in multiple multivariate regression (advisor: Guo Yu)

University of California, Santa Barbara, MA in Statistics 2022

University of Michigan, Ann Arbor, BS in Mathematics, Computer Science 2013

Experience

Research Engineer, Inria Centre – University Grenoble Alpes Summer 2024

- Developed scalable tools for fitting statistical mixed-effects models to brain imaging data
- Leveraged distributed high-performance computing clusters to analyze large datasets
- Accelerated computations by 300% through detailed analysis and simplification of numerical operations

Software Developer, Quantitative Risk Management Inc. – Chicago 2013 – 2020

- Developed the software framework for assessing interest rate, liquidity, and other risks associated with asset and liability management
- Designed and maintained database systems for complex financial products
- Built a system for cleaning and aggregating financial transaction data using K-means clustering
- Enhanced the portfolio optimization engine to support haircut modeling

Software Development Intern, Spot Trading LLC – Chicago Summer 2012

- Developed the trade management system of a proprietary options trading firm
- Implemented low-latency trade execution on the Boston Options Exchange

Projects

Deep residual networks for crystallography – SLAC National Accelerator Laboratory

- Developed a deep learning model in PyTorch for X-ray crystallography experiments
- Trained convolutional neural networks for regression and classification of experimental results
- Implemented transfer learning with ImageNet weights to improve prediction accuracy by 10%

Skills

Languages: Python, R, Julia, C++, C#, SQL

Packages: PyTorch, Jupyter, SciPy, tidyverse

Technologies: .NET, Linux, Docker, Apache Spark, Google Cloud Platform, Databricks

Statistical and machine learning: Proficiency with deep learning, xgboost, and other nonlinear prediction methods. Proficiency with classical methods such as OLS, LASSO, multivariate statistics, covariance estimation, time series analysis.

Publications

Estimation of the error structure in multivariate response linear regression models 2025

Liu, R., Yu, G.

10.1002/wics.70021 (WIREs Comput Stat, 17: e70021)

Deep residual networks for crystallography trained on synthetic data 2024

Mendez, D., Holton, J.M., Lyubimov, A.Y., Hollatz, S., Mathews, I.I., Cichosz, A., Martirosyan, V., Zeng, T., Stofer, R., ***Liu, R.***

10.1107/S2059798323010586 (Acta Crystallographica Section D: Structural Biology)

A convex formulation of covariate-adjusted Gaussian graphical models via natural parametrization
Liu, R., Yu, G., *Submitted*

A mixed model approach for estimating regional functional connectivity from voxel-level BOLD signals
Liu, R., Zhang, C., Achard, S., Meiring, W., Petersen, A., *In preparation*

Awards

- 2024 WNAR Most Outstanding Paper Award
- 2024 UCSB PSTAT Departmental Travel Grant
- 2024-25 UCSB Doctoral Student Travel Grant

Service

- Reviewer for *Nature Scientific Reports*

Presentations

A mixed model of regional functional connectivity from voxel-level BOLD signals

- WNAR/IMS Annual Meeting 2025; Whistler, BC

Covariate-adjusted Gaussian graphical models via natural parametrization

- WNAR/IMS/Graybill Annual Meeting 2024; Fort Collins, CO
- Joint Statistical Meetings 2024; Portland, OR
- CFE-CMStatistics 2024; London, UK
- Inria statistical research seminar 2024; Grenoble, FR

Teaching

Lead instructor: (PSTAT 10) Principles of Data Science

Teaching assistant: (PSTAT 232) Computational Statistics, (PSTAT 231) Statistical Machine Learning, (PSTAT 234) Statistical Data Science, (PSTAT 235) Big Data Analytics, (PSTAT 120B) Probability and Statistics II