

# Robin Liu

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## Education

<b>University of California, Santa Barbara</b> , Ph.D. in Statistics	2026 ( <i>expected</i> )
• <i>Thesis</i> – Covariate-adjusted error structures in multiple multivariate regression (advisor: Guo Yu)	
<b>University of California, Santa Barbara</b> , MA in Statistics	2022
<b>University of Michigan, Ann Arbor</b> , BS in Mathematics, Computer Science	2013

## Experience

<b>Research Engineer</b> , Inria Centre – University Grenoble Alpes	Summer 2024
• Developed scalable tools for fitting statistical mixed-effects models to brain imaging data	
<b>Software Developer</b> , 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	
<b>Software Development Intern</b> , 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

<b>Deep residual networks for crystallography</b> – 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

<b>Estimation of the error structure in multivariate response linear regression models</b>	2025
<b>Liu, R.</b> , Yu, G.	
10.1002/wics.70021 ↗ (WIREs Comput Stat, 17: e70021)	
<b>Deep residual networks for crystallography trained on synthetic data</b>	2024
Mendez, D., Holton, J.M., Lyubimov, A.Y., Hollatz, S., Mathews, I.I., Cichosz, A., Martirosyan, V., Zeng, T., Stofer, R., <b>Liu, R.</b>	

**A convex formulation of covariate-adjusted Gaussian graphical models via natural parametrization**

*Liu, R., Yu, G., In preparation*

**A mixed model approach for estimating regional functional connectivity from voxel-level BOLD signals**

*Liu, R., Zhang, C., Tran, C., Achard, S., Meiring, W., Petersen, A., Submitted*

## Awards

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

## Service

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- Reviewer for *Nature Scientific Reports*

## Presentations

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***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

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**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