

Lu Zhang

Curriculum Vitae

Division of Biostatistics
Department of Population and Public Health Sciences
University of Southern California
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Employment

- 2022–current **Assistant Professor**, *University of Southern California, USA.*
2020–2022 **Postdoctoral Researcher**, *Columbia University, USA.*
Supervisor: Bob Carpenter, Andrew Gelman

Education

- 2014–2020 **Ph.D. in Biostatistics**, *University of California, Los Angeles, USA.*
Advisor: Sudipto Banerjee
2010–2014 **B.S. in Mathematics and Applied Mathematics**, *Fudan University, China.*

Research Interests

Spatial analysis, Bayesian statistics, high dimensional inference, computational statistics and open-source software development

Papers (* co-first author)

Publications and Manuscripts Under Revision

1. **Lu Zhang**, Bob Carpenter, Andrew Gelman, Aki Vehtari (2022). Pathfinder: Parallel quasi-Newton variational inference. ***Journal of Machine Learning Research***. Accepted <https://arxiv.org/abs/2108.03782>
2. **Lu Zhang** (2022). Applications of Conjugate Gradient in Bayesian computation. ***Wiley StatsRef-Statistics Reference Online***. Accepted
3. Wenpin Tang*, **Lu Zhang***, Sudipto Banerjee, On identifiability and consistency of the nugget in Gaussian spatial process models. ***Journal of the Royal Statistical Society Series B, (Statistical Methodology)***, <https://arxiv.org/abs/1908.05726>
4. **Lu Zhang**, Sudipto Banerjee, (2021) Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Misaligned Data. ***Biometrics***, 78(2), 560-573.. <http://doi.org/10.1111/biom.13452>
5. **Lu Zhang**, Sudipto Banerjee, Andrew O. Finley (2021). High-dimensional multi-variate geostatistics: A Bayesian matrix-normal approach. ***Environmetrics***, 32(4), e2675.. <https://onlinelibrary.wiley.com/doi/10.1002/env.2675>

6. Gregory L. Watson, Di Xiong, **Lu Zhang**, Joseph A. Zoller, John Shamsioian, Phillip Sundin, Teresa Bufford, Anne W. Rimoin, Marc A. Suchard, Christina M. Ramirez (2021). Pandemic velocity: forecasting COVID-19 in the US with a machine learning & Bayesian time series compartmental model. *PLOS Computational Biology*, 17(3), e1008837.
 7. Di Xiong*, **Lu Zhang***, Gregory L. Watson, Phillip Sundin, Teresa Bufford, Joseph A. Zoller, John Shamsioian, Marc A. Suchard, Christina M. Ramirez, (2020). Pseudo-likelihood based logistic regression for estimating COVID-19 infection and case fatality rates by gender, race, and age in California. *Epidemics*, 33, 100418. <https://www.sciencedirect.com/science/article/pii/S1755436520300396>
 8. **Lu Zhang**, Abhirup Datta, Sudipto Banerjee. (2019). Practical Bayesian modeling and inference for massive spatial data sets on modest computing environments. *Statistical Analysis and Data Mining: The ASA Data Science Journal*, 12(3), 197-209. <https://onlinelibrary.wiley.com/doi/full/10.1002/sam.11413>
- [Preprints](#)
9. **Lu Zhang***, Wenpin Tang*, Sudipto Banerjee, Fixed-Domain Asymptotics Under Vecchia's Approximation of Spatial Process Likelihoods. Submitted. <https://arxiv.org/abs/2101.08861>

Packages

1. **Lu Zhang** and Jun Yin (2018). *phase1PRMD: Personalized Repeated Measurement Design for Phase I Clinical Trials*. R package version 1.0.2. CRAN: <https://cran.r-project.org/web/packages/phase1PRMD/index.html>
2. Xiang Chen, **Lu Zhang**, Sudipto Banerjee (2018). *JAMAJniLite: A JAVA package providing a java interface for lapack and blas libraries and using the classes defined by JAMA Package Github*: <https://github.com/JAMAJni/JAMAJniLite>
3. **Lu Zhang**, LiZhen Nie, Sudipto Banerjee (2017). *JALAJni: A JAVA package providing a java interface for lapack and blas library Github*: <https://github.com/JaLAJni/JaLAJni>

Teaching Experience

Graduate Teaching Assistant at UCLA

- 2015-2020 Biostat 100A: **Introduction to Biostatistics**
(Summer 2015, Fall 2015, Spring 2016, Summer 2017, Fall 2019)
- 2016-2020 Biostat 100B: **Introduction to Biostatistics**
(Winter 2016, Winter 2017, Winter 2018, Winter 2020)
- Fall 2016 Biostat 200A: **Basic Biostatistics**
- Spring 2017 Biostat 411: **Analysis of Correlated Data**
- Fall 2017 Biostat 255A: **Advanced Topics & Probability in Biostatistics**
- Winter 2017 Biostat 255B: **Advanced Topics & Probability in Biostatistics**
- Spring 2018 Biostat 257: **Statistical Computing**
- Spring 2019 Biostat 241: **Spatial modeling**

Fall 2019 Public Health 200: **Foundations in Public Health**
Spring 2020 Biostat 214: **Finite Population Sampling**

Working Experience

Jun. - Sep. 2018 **Internship in Biostatistics**, *Mayo Clinic*, Rochester, Minnesota USA,
Sponsor: Yin Jun, Ph.D.

- Statistical consultation to Physicians
- Experimental design (clinical trial design)
- Software development (develop R package)

Selected Awards

2020 **Dean's Outstanding Student Award in Biostatistics**, Department of Biostatistics, UCLA
2018 **Celia G. and Joseph G. Blann Fellowship**, Department of Biostatistics, UCLA
2016 **Graduate Summer Research Mentorship**, Department of Biostatistics, UCLA

Talks

Invited

Sep. 2022 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations.**
SIAM, Conference on Mathematics of Data Science, San Diego, CA, USA
Aug. 2022 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations.**
JSM, Washington, DC, USA
Apr. 2022 **Pathfinder: A parallel quasi-Newton algorithm for reaching regions of high probability mass.**
SIAM Conference on Uncertainty Quantification (UQ22), Atlanta, Georgia, U.S.
Apr. 2022 **Pathfinder: A parallel quasi-Newton algorithm for reaching regions of high probability mass.**
SIAM Conference on Uncertainty Quantification (UQ22), Atlanta, Georgia, U.S.
Nov. 2021 **Pathfinder: Parallel quasi-Newton variational inference.**
Broad Institute, Remote
Sep. 2021 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations.**
Mathematics and Applied Mathematics at Fudan University, Shanghai, China
Sep. 2021 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations.**
School of Statistics and Management at Shanghai University of Finance and Economics, Shanghai, China
Jun. 2021 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations.**
Biostatistics at Columbia University, New York, New York, USA

- Dec. 2020 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Mis-aligned Data.**
Johns Hopkins University BLAST working group, Baltimore, Maryland, USA
- Mar. 2020 **High-dimensional Multivariate Geostatistics: A Bayesian Matrix-Normal Approach.**
ENAR, Nashville, Tennessee, USA
[Contributed](#)
- Aug. 2022 **Bayesian Predictive Stacking Under Spatial Process Settings.**
IMSI Workshop, Chicago, IL, USA
- Aug. 2021 **Pathfinder: A Parallel Quasi-Newton Algorithm for Reaching Regions of High Probability Mass.**
Joint Statistical Meetings
- Aug. 2020 **Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Mis-aligned Data.**
Bernoulli-IMS One World Symposium 2020
- Jul. 2019 **Bayesian Linear Model of Coregionalization (BLMC) for Large Scale Datasets with Accelerated Posterior Sampling Algorithm.**
Joint Statistical Meetings, Colorado, USA, poster presentation
- Aug. 2017 **Practical Bayesian Inference Based on Nearest Neighbor Gaussian Processes Model for Massive Spatial Data.**
Joint Statistical Meetings, Baltimore, Maryland, USA

Referee Experience

Journal of the Royal Statistical Society: Series B (1)
Journal of Computational and Graphical Statistics (4)
Annals of Applied Statistics (1)
Nature Communications (1)
Statistical Science (1)
Environmetrics (1)