Lu Zhang

Curriculum Vitae

Department of Statistics
Columbia University
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Employment

2020–current **Postdoctoral Researcher**, *Columbia University*, USA.
Supervisor: Bob Carpenter, Andrew Gelman

Education

2014–2020 **Ph.D. in Statistics**, *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, statistical computing and related software development

Papers (* co-first author)

Publications and Manuscripts Under Revision

1. 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***, accepted. `https://arxiv.org/abs/1908.05726`
2. **Lu Zhang**, Sudipto Banerjee, (2021) Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Misaligned Data. ***Biometrics***. `http://doi.org/10.1111/biom.13452`
3. **Lu Zhang**, Sudipto Banerjee, Andrew O. Finley (2021). High-dimensional multivariate geostatistics: A Bayesian matrix-normal approach. ***Environmetrics***. `https://onlinelibrary.wiley.com/doi/10.1002/env.2675`
4. Di Xiong*, **Lu Zhang***, Gregory L. Watson, Phillip Sundin, Teresa Bufford, Joseph A. Zoller, John Shamshoian, 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*** `https://www.sciencedirect.com/science/article/pii/S1755436520300396`
5. **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*** `https://onlinelibrary.wiley.com/doi/full/10.1002/sam.11413`

6. Gregory L. Watson, Di Xiong, **Lu Zhang**, Joseph A. Zoller, John Shamshoian, 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***, accepted. `https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3594606`

Preprints

7. **Lu Zhang***, Wenpin Tang*, Sudipto Banerjee, Fixed-Domain Asymptotics Under Vecchia's Approximation of Spatial Process Likelihoods. Submitted. `https://arxiv.org/abs/2101.08861`
8. **Lu Zhang**, Bob Carpenter, Andrew Gelman, Aki Vehtari. Pathfinder: Parallel quasi-Newton variational inference. Submitted. `https://arxiv.org/abs/2108.03782`

Packages

1. **Lu Zhang**, LiZhen Nie, Sudipto Banerjee, *JALAJni: A JAVA package providing a java interface for lapack and blas library Github:* `https://github.com/JaLAJni/JaLAJni`
2. Xiang Chen, **Lu Zhang**, Sudipto Banerjee, *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** 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`

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)

Referee Experience

Journal of the Royal Statistical Society: Series B (1)

Journal of Computational and Graphical Statistics (3)

Statistical Science (1)

Environmetrics (1)

Annals of Applied Statistics (1)

Selected Awards

2020 **Dean's Outstanding Student Award in Biostatistics**, Department of Biotatistics, UCLA

2018 **Celia G. and Joseph G. Blann Fellowship**, Department of Biotatistics, UCLA

2016 **Graduate Summer Research Mentorship,** Department of Biotatistics, UCLA

Talks

Invited

Jun. 2021 **Biostatistics at Columbia University, New York, New York, USA**.
Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Massive Spatial Data with Missing Observations

Dec. 2020 **Johns Hopkins University BLAST working group, Baltimore, Maryland, USA**.
Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Misaligned Data

Mar. 2020 **ENAR, Nashville, Tennessee, USA**.
High-dimensional multivariate Geostatistics: A Bayesian Matrix-Normal Approach.

Contributed

Aug. 2021 **Joint Statistical Meetings, Online**.
Pathfinder: A parallel quasi-Newton algorithm for reaching regions of high probability mass

Aug. 2020 **Bernoulli-IMS One World Symposium 2020, Online**.
Spatial Factor Modeling: A Bayesian Matrix-Normal Approach for Misaligned Data

Jul. 2019 **Joint Statistical Meetings, Colorado, USA**, *poster presentation*.
Bayesian linear model of coregionalization (BLMC) for large scale datasets with accelerated posterior sampling algorithm

Aug. 2017 **Joint Statistical Meetings, Baltimore, Maryland, USA**.
Practical Bayesian inference based on Nearest Neighbor Gaussian Processes model for massive spatial data