

# Lan Luo

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Department of Biostatistics and Epidemiology  
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## Education

2016 - 2020	UNIVERSITY OF MICHIGAN Ph.D. Biostatistics (Advisor: Peter X.K. Song)	Ann Arbor, MI
2014 - 2016	UNIVERSITY OF MICHIGAN M.S. Biostatistics	Ann Arbor, MI
2009 - 2013	HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY B.S. Biology	Wuhan, China

## Research Interests

Online statistical inference, dynamic mediation analysis, longitudinal data analysis, mobile health, adaptive experimental design, causal inference, epigenetic clocks

## Professional Appointments

2023 - Present	<b>Assistant Professor</b> Department of Biostatistics, School of Public Health Rutgers University	Piscataway, NJ
2020 - 2023	<b>Assistant Professor</b> Department of Statistics and Actuarial Science College of Liberal Arts and Science University of Iowa	Iowa City, IA

## Teaching Experience

2023 Fall	<b>Instructor</b> , <i>Biostatistics Theory I</i> Department of Biostatistics & Epidemiology, Rutgers University
2023 Spring	<b>Instructor</b> , <i>Applied Linear Regression</i> Department of Statistics & Actuarial Science, University of Iowa
2021 Fall	<b>Instructor</b> , <i>Introduction to Data Science (new course)</i> Department of Statistics & Actuarial Science, University of Iowa
2020 - 2022 Fall	<b>Instructor</b> , <i>Mathematical Statistics I</i> Department of Statistics & Actuarial Science, University of Iowa
2021 - 2023 Spring	<b>Instructor</b> , <i>Mathematical Statistics II</i> Department of Statistics & Actuarial Science, University of Iowa

## Publications

1. Tran, L., Li, G., **Luo, L.** and Jiang, H. (2023). *ECLasso*: Fitting equality-constrained,  $\ell_1$ -penalized models with inexact ADMM to find gene pairs. *The Journal of Computational and Graphical Statistics* (accepted).

2. **Luo, L.\***, Han, R.\*, Lin, Y. and Huang, J. (2023). Statistical inference in high-dimensional generalized linear models with streaming data. *Electronic Journal of Statistics* (accepted).
3. Han, R.\*, **Luo, L.\***, Lin, Y. and Huang, J. (2023). Online inference with debiased stochastic gradient descent. *Biometrika* (accepted).
4. Liu, W., **Luo, L.** and Zhou, L. (2023). Online missing value imputation for high-dimensional mixed-type data via generalized factor models. *Computational Statistics and Data Analysis* (accepted).
5. **Luo, L.**, Wang, J. and Hector, E.C. (2023). Statistical inference for streamed longitudinal data. *Biometrika* (accepted with invitation for Discussion).
6. **Luo, L.**, Zhou, L. and Song, P.X.K. (2022). Real-time regression analysis of streaming clustered data with possible abnormal data batches. *Journal of the American Statistical Association (Theory & Methods)* (accepted).
7. **Luo, L.** and Li, L. (2022). Online two-way estimation and inference via linear mixed-effects models. *Statistics in Medicine* (accepted).
8. Hector, E.C.\*, **Luo, L.\*** and Song, P.X.K. (2022). Parallel-and-stream accelerator (PASA) in fast computing for big data. *Computational Statistics and Data Analysis* (accepted).
9. **Luo, L.** and Song, P.X.K. (2021). Multivariate online regression analysis with heterogeneous streaming data. *The Canadian Journal of Statistics*. <http://doi.org/10.1002/cjs.11667>.
10. **Luo, L.** and Song, P.X.K. (2020). Renewable estimation and incremental inference in generalised linear models with streaming datasets. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, **82**, Part1, 69–97. An earlier version of this paper “real-time regression analysis of streaming health datasets” won the 2019 ENAR Distinguished Student Paper Award.
11. **Luo, L.**, She, X.C., Cao, J., Zhang, Y.L., Li, Y., Song, P.X.K. (2019). Detection and prediction of ovulation time from body temperature measured by YONO earbud. *IEEE Transactions on Biomedical Engineering*, **67**(2): 512–522.
12. Shen, R., **Luo, L.** and Jiang, H. (2017). Identification of gene pairs through penalized regression subject to constraints. *BMC Bioinformatics*, **18**: 466.
13. Yang, Y.\*, **Luo, L.\***, Xu, J.\* et al. (2013). Novel EDA p.Ile260Ser mutation linked to non-syndromic hypodontia. *Journal of Dental Research*, **92**: 500–506.

Manuscripts In Revision

14. Li, Z., **Luo, L.**, Wang, J. and Feng, L. (2023). Efficient quantile covariate adjusted response adaptive experiments. *In Revision at the Journal of Econometrics*.
15. Shi, X.\* and **Luo, L.\*** (2021+). Sequential monitoring and near real-time post-market vaccine safety surveillance. *In Revision at Statistics in Medicine*.

Manuscripts Submitted

16. **Luo, L.\***, Shi, C.\*, Wang, J.\*, Wu, Z. and Li, L. (2023). Multivariate dynamic mediation analysis under a reinforcement learning framework.

(\*: Co-first authors)

## Grants

1. Transfer learning and uncertainty quantification in epigenetic clocks  
Role: Principal Investigator  
Agency: NIH (R21AG083364)  
Period: 09/30/2023 - 05/31/2025  
Amount: \$327,576  
Effort: 20% FTE
2. Maternal inflammation in relation to offspring epigenetic aging and neurodevelopment  
Role: Co-Investigator  
PI: Stephanie Shiau  
Agency: NIH (R01HD111550)  
Period: 6/1/23-5/31/27  
Effort: 5% FTE

## Graduate Student Mentored

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|-------------|--|--------------------|
| 2022 - 2023 | MS Creative Component Advisor  | University of Iowa |
|             | Yilin Wang, <i>Online statistical inference and conformal prediction with nonstationary streaming data</i> |                    |
| 2023        | PhD Dissertation Committee Member  | University of Iowa |
|             | Yoon Cho, <i>Modeling association between wearable device metrics and health outcomes</i>                  |                    |

## Honors and Awards

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|------|--|
| 2022 | Old Gold Summer Fellowship   |
| 2020 | Student Paper Competition Award for Statistical Learning and Data Science                                    |
| 2020 | Winning Proposal in the 2020 Joint Shark Tank Retreat  |
| 2019 | Excellence in Research Honorable Mention   |
| 2019 | Rackham Predoctoral Fellowship for Academic Year 2019-2020   |
| 2019 | The International Biometric Society Eastern North American Region's (ENAR) Distinguished Student Paper Award |
| 2018 | The Michigan Institute for Data Science (MIDAS) Annual Symposium Poster Award of Most Innovative Use of Data |
| 2015 | Outstanding Academic Performance First-Year Master's Program   |
| 2015 | Certificate in Public Health Genetics (CPHG) Award   |
| 2013 | HUST Excellent Graduate  |
| 2011 | China National Scholarship   |

## Presentations

### Department - Colloquium

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| 2023 | <i>Online Statistical Inference with Streaming Data: Renewability, Dependence, and Dynamics</i> , Department of Statistics, North Carolina State University, Raleigh, NC, United States. |
| 2022 | <i>Online Statistical Inference in Streaming Data: Renewability, Dependence, and Dynamics</i> , Department of Biostatistics and Epidemiology, Rutgers University (virtual).              |

- 2022 *Online Statistical Inference in Streaming Data: Renewability, Dependence, and Dynamics*, Department of Statistics, North Carolina State University (virtual).
- 2022 *Online Statistical Inference with Dynamic and Dependent Streaming Data*, Data Mining Iowa Group, Business Analytics Department, University of Iowa, Iowa City, IA, United States.
- 2022 *Real-Time Regression Analysis with Dynamic Streaming Datasets*, StatScale seminars, Lancaster University, Bailrigg, Lancaster, United Kingdom (virtual).
- 2021 *Real-Time Regression Analysis with Streaming Health Datasets*, Department of Biostatistics, College of Public Health, University of Iowa, Iowa City, IA, United States (virtual).
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Statistics and Actuarial Science, University of Iowa, Iowa City, IA, United States.
- 2020 *Real-Time Regression Analysis with Streaming Health Datasets*, Public-Health Sciences – Biostatistics Program, Fred Hutchinson Cancer Research Center, Seattle, WA, United States.
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Statistics, UW Madison College of Letters & Science, Madison, WI, United States.
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Statistics and Data Sciences, College of Natural Sciences, The University of Texas at Austin, Austin, TX, United States.
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Statistics and Operations Research, The University of North Carolina at Chapel Hill, Chapel Hill, NC, United States.
- 2020 *Real-Time Regression Analysis with Streaming Health Datasets*, Department of Biostatistics, Fielding School of Public Health, University of California, Los Angeles, CA, United States.
- 2020 *Real-Time Regression Analysis with Streaming Health Datasets*, Department of Biostatistics, University of Minnesota, Minneapolis, Minnesota, United States.
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Mathematics and Statistics, McGill University, Montreal, Quebec, Canada.
- 2020 *Renewable Estimation and Incremental Inference with Streaming Health Datasets*, Department of Statistics and Actuarial Science, University of Waterloo, Waterloo, ON, Canada.

International - Conference Presentation

2023	<i>Sequential Monitoring and Near Real-Time Post-Market Vaccine Safety Surveillance</i> . 2023 ICSA Applied Statistics Symposium, Ann Arbor, MI, United States.
2022	<i>Multivariate Online Regression Analysis with Heterogeneous Streaming Data</i> . Joint Statistical Meetings, Washington D.C., United States.
2022	<i>Multivariate Online Regression Analysis with Heterogeneous Streaming Data</i> . The Fifth ICSA-Canada Chapter Symposium, Banff, Canada.
2021	<i>Multivariate Online Regression Analysis with Heterogeneous Streaming Data</i> . International Chinese Statistical Association (virtual).
2021	<i>Sequential Monitoring and Near Real-Time Post-Market Vaccine Safety Surveillance</i> . International Chinese Statistical Association (virtual).
2020	<i>Real-Time Regression Analysis of Streaming Clustered Datasets</i> . Joint Statistical Meetings (virtual).

## Software

R packages: glmADMM, RenewGLM, RenewQIF (available on <https://github.com/luolsph>)

## Technical Skills

R, Rcpp, SAS, Python, SQL, Matlab, TeX

## Professional Activities and Service

### Journal referee

Journal of the American Statistical Association, Biometrika, Journal of Econometrics, Annals of Applied Statistics, Statistical Sinica, Biometrics, Statistics in Medicine, Electronic Journal of Statistics, Journal of Computational and Graphical Statistics, Technometrics, Statistics and Its Interface, Scandinavian Journal of Statistics, Statistics in Biosciences, Computational Statistics and Data Analysis, IEEE Transactions on Neural Networks and Learning Systems, International Journal of Biostatistics

### Department

2023	Colloquium committee, Member
2022 - 2023	Executive committee, Member
2021 - 2022	Graduate Minor Exam Committee, Member
2020 - 2023	Computer Committee, Member
2020 - 2022	Social Committee, Chair

### Member

2021 - present	International Chinese Statistical Association
2018 - present	American Statistical Association
2017 - present	International Biometric Society, ENAR

Conference service

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|------|---|
| 2023 | ICSA Applied Statistics Symposium, Session Organizer and Chair, <i>Causal inference in observational studies and adaptive experiments</i> |
| 2023 | ICSA Applied Statistics Symposium, Student Paper Competition Committee  |
| 2023 | Joint Statistical Meetings, Statistical Learning and Data Science (SLDS) Student Paper Competition Committee                              |
| 2022 | Joint Statistical Meetings, Session Organizer and Chair, <i>Recent advances in streaming data analytics</i>                               |