

Li Zhaohui

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Working Experience

- **Georgia Institute of Technology** Atlanta
Postdoc 2021.07-Present
Advisor: **Jeff Wu**
- **City University of Hong Kong** Hong Kong
Research Assistant 2020.09-2021.04
Advisor: **Matthias Tan**

Education

- **City University of Hong Kong** Hong Kong
Joint Ph.D. in Statistics 2018.09-2020.07
Advisor: **Matthias Tan**
- **Academy of Mathematics and Systems Science, CAS** Beijing
Ph.D. in Statistics 2014.09-2020.07
Advisor: **Dan Yu**
- **University of Science and Technology of China** Hefei
B.S in Mathematics 2010.09-2014.06
Honor degree of Hua Loo-Keng Talent Program in Mathematics

Research Areas

- **Industrial Statistics**
- **Design and Analysis of Computer Experiments**
- **Physics-Informed Machine Learning**

Research Interests

My research interests involve integrating domain knowledge (e.g., conservation law, mechanical models, bio-system models) into statistical modeling and parameter inference.

In particular, I'm working on building new statistical models and machine learning algorithms for inference problems, providing a novel way for scientists to calibrate their scientific model from data, and for statisticians to integrate scientific knowledge for parameter inference and uncertainty quantification of a complex computer model.

The applications of my research include system reliability analysis, the calibration of fluid dynamic models, hydrology, etc.

Publications

- **Published Journal Papers**

[1]. Du, S., **Li, Z.**, Yu, D., Li, D., & Hu, Q. (2020) *Exact Confidence Limit for Complex System Reliability Based on Component Test Data*. Quality Technology & Quantitative Management, 17(1), 75-88.

[2]. **Li, Z.**, Yu, D., Liu, J., & Hu, Q. (2021) *Higher-order Normal Approximation Approach for Highly Reliable System Assessment*. IISE Transactions, 52(5), 555-567.

[3]. **Li, Z.**, & Tan, M.H. (2022) *A Gaussian Process Emulator Based Approach for Bayesian Calibration of a Functional Input*. Technometrics, 64(3),299-311.

- **Submitted Journal Papers**

[4]. **Li, Z.**, Yang, S., & Wu, J. (2022+) *Inference of Nonlinear Partial Differential Equations via Constrained Gaussian Processes*. Submitted to SIAM Journal on Uncertainty Quantification.

[5]. Fan, Z., **Li, Z.***, Wang, J., Lin, D.K.J., Xiong, X., & Hu, Q. (2022+) *A Bayesian Robust Regression Method for Corrupted Data Reconstruction*. Submitted to Journal of Quality Technology.

- **Conference Papers**

[6]. **Li, Z.**, Hu, Q., & Yu, D. (2016) *Higher order normal approximation approach for system reliability assessment*. In 2016 11th International Conference on Reliability, Maintainability, and Safety (ICRMS 2016) (pp. 1-6). IEEE.

[7]. Fan, Z., **Li, Z.**, & Hu, Q. (2022) *Robust Bayesian Regression via Hard Thresholding*. In 36th Conference on Neural Information Processing Systems (NeurIPS 2022).

- **Book Chapters**

[8]. **Li, Z.**, & Tan, M.H. (2022) *Improving Gaussian Process Emulators with Boundary Information*. Artificial Intelligence, Big Data and Data Science in Statistics, 171-192.

- **Working Papers**

[9]. **Li, Z.**, Yang, S., & Wu, J. (2023+) *Stochastic Differential Equations informed Gaussian Process for Parameter Inference*.

[10]. **Li, Z.**, Tan, M.H., & Wu, J. (2023+) *A Parameterization-Invariant Framework for Bayesian Calibration of Positive Definite Matrix*.

Honors & Awards

- **Honorable Mention for the Best Paper in the 2020 IISE Transactions** USA
IISE transactions Annual Meeting 2021
- **IISE transactions Featured Article** USA
IISE transactions 2019
- **Best Paper Award** Hangzhou
The 11th International Conference on Reliability, Maintainability and Safety (ICRMS) 2016
- **Outstanding Freshman Scholarship** Beijing
Academy of Mathematics and Systems Science, Chinese Academy of Sciences 2014
- **Honor degree of Hua Loo-Keng Talent Program in Mathematics** Hefei
Unicersity of Science and Technology of China 2014

*Corresponding author

- **National Scholarship** Hefei
2013
University of Science and Technology of China
- **Outstanding Undergraduate Scholarship** Hefei
2011,2012
University of Science and Technology of China

Presentations

- **Invited Talks**

Functional Input Estimation Using a Gaussian Process Prior with Uncertain Correlation Parameters. (2019) Workshop on Uncertainty Quantification, Yunnan University, Kunming.

A Gaussian Process Emulator based Bayesian Calibration for Functional Parameters. (2020) Academy of Mathematics and System Sciences, Chinese Academy of Sciences, Beijing.

A Partial Differential Equation Constrained Gaussian Processes Inference Method. (2021) Academy of Mathematics and System Sciences, Chinese Academy of Sciences, Beijing.

Inference of Nonlinear Partial Differential Equations via Constrained Gaussian Processes. (2022) Louisiana State University, Baton Rouge.

- **Poster Presentations**

Robust Bayesian Regression via Hard Thresholding. (2022) The 36th Conference on Neural Information Processing Systems (NeurIPS), New Orleans.

- **Contributed Talks**

Higher-order Normal Approximation Approach for Highly Reliable System Assessment. (2016) International Research Conference on Systems Engineering and Management Science (ICR-SEMS). Beijing.

Higher order normal approximation approach for system reliability assessment. (2016) The 11th International Conference on Reliability, Maintainability and Safety (ICRMS) Hangzhou.

The Buehler lower limits on system reliability based on the component experiment data. (2016) The 7th Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling (APARM), Seoul.

Improved WCF expansion to assessing the reliability of complex systems. (2017) The 10th International Conference on Mathematical Methods in Reliability (MMR), Grenoble.

Higher order normal approximation approach for highly reliable system assessment. (2021) The IISE Annual Meeting. (Virtual).

A Gaussian Process Emulator Based Approach for Bayesian Calibration of a Functional Input. (2021) INFORMS Annual Meeting. (Virtual) Anaheim, California.

Calibration of Physics Informed Computer Models with Functional Inputs. (2022) SIAM Conference on Uncertainty Quantification (UQ22). Atlanta, Georgia.

Teaching

- **Seminars**

Design of Experiments (2016) Beijing.

Design and Analysis of Computer Experiments (2017) Beijing.

Sensitivity Analysis (2021) Atlanta, Georgia.

- **Special Topic Lecture**

Introduction to Multi-armed Bandit and Thompson Sampling (2021) Atlanta, Georgia.

Sevices

- **Reviewer for IISE transactions, Statistical Papers, and Technometrics.**
- **Co-chair of General Session in the 10th International Conference on Mathematical Methods in Reliability (MMR), 2017, Grenoble .**

Patents

于丹, 李赵辉, 胡庆培. 系统级产品可靠性综合评估置信推断方法. CN106169124A[P]

于丹, 李赵辉, 胡庆培. 多批次成败型试验下产品贮存期评估的 Buehler 方法. CN106251044A[P].

Programming Skills

- **MATLAB, Python and R**