JINGYANG LYU

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EDUCATION

University of Wisconsin-Madison, WI, USA *09/2022 - 05/2027*
- Ph.D. in *Statistics*, *Computer Science* (Minor) (advisor: Yiqiao Zhong). GPA: 4.00/4.00
- **Honors & Awards: Frontiers in Statistical Machine Learning Travel Award** (2025, the Institute of Mathematical Statistics (IMS)). **Student Best Poster Award** (2025, New England Statistical Society). **Honorable Mention Poster Award** (2025, Midwest Machine Learning Symposium).

University of Chicago, IL, USA *09/2020 - 06/2022*
- M.S. in *Statistics* (advisor: Wei-Biao Wu). GPA: 3.97/4.00
- **Honors & Awards:** Tuition Scholarship Increase (2021).

Tsinghua University, Beijing, China *08/2016 - 06/2020*
- B.Eng. in *Industrial Engineering*. GPA: 3.71/4.00 (Rank: 7/63)
- Minor in *Statistics*. GPA: 3.94/4.00
- **Honors & Awards:** Outstanding Academic Performance & Progress Scholarship (2019), Excellent Student Leadership Award (2018), Excellent Social Worker Scholarship (2018)

INDUSTRY EXPERIENCE

United Airlines, Chicago, IL *05/2025 - 08/2025*
Research Scholar - Statistics, *Internship*
- Built machine learning models (XGBoost, Transformer-based) for customer lifetime value forecasting, leveraging 500M transaction records across 40M members with 30^+ engineered behavioral and loyalty features; supported segmentation and personalized retention for the MileagePlus$^{®}$ program.
- Reduced RMSE by 47% vs. the previous model; insights supported marketing and loyalty operations, with projected impact of \$6M in annual revenue retention and an estimated ROI exceeding 30×.

RESEARCH INTERESTS

◇ High-dimensional Statistics   ◇ Statistical Foundations of Deep Learning
◇ Bias in Large Language Models   ◇ Applied Statistics

PUBLICATIONS

1. **Lyu, J.**, Zhou, K., Zhong, Y. (2026). A Statistical Theory of Overfitting for Imbalanced Classification. *The Fourteenth International Conference on Learning Representations (ICLR)*.
2. Wei, Z., Zhu, W., **Lyu, J.**, Wu, W. B. (2026). Refining Covariance Matrix Estimation in Stochastic Gradient Descent through Bias Reduction. *The 29th International Conference on Artificial Intelligence and Statistics (AISTATS)*.
3. Chen, F., **Lyu, J.***, Wang, T., Sze, N. N. (2023). Exploring the association between quantified road safety target attributes and their success: An empirical analysis from OECD countries using panel data. *Journal of safety research, 85*, 296-307.
4. Chen, F., Zhu, Y., Zu, J., **Lyu, J.**, Yang, J. (2022). Appraising road safety attainment by CRITIC-ELECTRE-FCM: a policymaking support for Southeast Asia. *Transport policy, 122*, 104-118.
5. Chen, F., **Lyu, J.***, Wang, T. (2020). Benchmarking road safety development across OECD countries: An empirical analysis for a decade. *Accident Analysis & Prevention, 147*, 105752.

THESIS

Online Bootstrap Confidence Intervals for Stochastic Gradient Descent (SGD). *06/2022*
Supervised by *Prof. Wei-Biao Wu*, Department of Statistics, University of Chicago

- Conducted statistical inference for SGD by using Bootstrap perturbed estimates, with mathematical details added and improved for the proofs of a previous study.
- Performed simulation experiments for regressions models and real data analysis by using R.

Fault Diagnosis of High-Speed Train Based on Imbalanced Learning. *06/2020*

Supervised by *Prof. Yan-Fu Li*, Department of Industrial Engineering, Tsinghua University
- Proposed an algorithm, i.e., Recursive Different-Error-Costs Support Vector Machine (R-DEC-SVM), which can handle highly imbalanced classification tasks, implemented in R.
- Outperformed previous methods on a train operation dataset in terms of fault detection.

TALKS AND PRESENTATIONS

- *The Inaugural Workshop on Frontiers in Statistical Machine Learning (FSML)*, Vanderbilt — 2025.08
- *Midwest Machine Learning Symposium (MMLS 2025)*, UChicago — 2025.06
- *The 38th New England Statistics Symposium (NESS 2025)*, Yale — 2025.06
- *Midwest Optimization & Statistical Learning Conference 2025*, Northwestern — 2025.05
- *6th Annual Data Science Research Bazaar*, UW–Madison — 2025.03
- *Math Machine Learning seminar MPI MIS + UCLA*, UCLA — 2025.03
- *Institute for Foundations of Data Science Ideas Forum*, UW–Madison — 2024.11
- *100th Transportation Research Board (TRB) Annual Meeting*, Virtual — 2021.01

TEACHING

Teaching Assistant at University of Wisconsin–Madison
- STAT 324   Introductory Applied Statistics for Engineers — Fall 2022
- STAT 240   Data Science Modeling I — Spring 2023
- STAT 340   Data Science Modeling II — Fall 2023
- STAT 601   Statistical Methods I — Spring 2024
- STAT 709   Mathematical Statistics — Fall 2024
- STAT 340   Data Science Modeling II — Spring 2025
- STAT 709   Mathematical Statistics — Fall 2025
- STAT 601   Statistical Methods I — Spring 2026