Dongmin LI

H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology

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EDUCATION

Ph.D. Industrial Engineering, Georgia Institute of Technology, Aug 2024 – Expected May 2026
- **Advisor**: Dr. Xiaochen Xian
- **Minor**: Machine Learning
- **Dissertation Title**: Data-Driven Prediction and Adaptive Decision-Making for Sequential Monitoring of   Complex Systems

    Industrial and Systems Engineering, University of Florida, May 2021 – Aug 2024

M.S. Statistics, University of Chinese Academy of Sciences, Sep 2017 – Jun 2020

B.S. Mathematics and Applied Mathematics, Dalian University of Technology, Sep 2013 – Jun 2017
- Hua Loo-Keng Talent Program (joint program with Chinese Academy of Sciences)

RESEARCH INTERESTS

Data analytics and system informatics; Spatiotemporal modeling and online monitoring; Adaptive sampling; Machine learning for complex system modeling and decision-making; Moving vehicle-based sensors; Smart manufacturing

PUBLICATIONS

1. **Li, D.**, Bai, M., & Xian, X. (2024). Data-driven Pathwise Sampling Approaches for Online Anomaly Detection. *Technometrics*, 66(4), 600-613.
   - *Best Referred Paper Finalist* in Quality, Statistics, and Reliability Section of INFORMS, 2021
   - *Feature Article* in Advances in Engineering

2. 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.

3. **Li, D.**, Hu, Q., Wang, L., & Yu, D. (2019). Statistical Inference for M_t/G/Infinity Queueing Systems Under Incomplete Observations. *European Journal of Operational Research*, 279(3), 882-901.
   - *Best Paper Award* in Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling & International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering, 2018

4. **Li, D.**, Bai, M., Wang, D., & Xian, X. A Bayesian Jump Model-based Pathwise Sampling Approach for Online Anomaly Detection. *IISE Transactions*, under minor revision.
   - *Best Student Paper Finalist* in Data Mining Society of INFORMS, 2024

5. **Li, D.**, Kang, M., Singer, G., Liu, H., Hasan, M., & Xian, X., On-Demand Machine Learning for Resource-Constrained Classification. *INFORMS Journal on Data Science*, under major revision.

6. Zan, X., **Li, D.**, & Xian, X. Within-layer In-situ Quality Monitoring of Additive Manufacturing Processes Along Tool Paths. *Journal of Quality Technology*, under review.
   - *Data Challenge Competition Finalist* in Statistics and Reliability Section, INFORMS, 2021

7. **Li, D.**, & Xian, X. Theoretical Analysis and Design of an Online Monitoring and Sampling Scheme Under Partial Observations, to be submitted to *Technometrics*.
   - *Best Student Paper Finalist* in Quality, Statistics, and Reliability Section of INFORMS, 2025
8. **Li, D.**, & Xian, X. Physics-informed Machine Learning for Droplet Evolution Prediction in Inkjet Printing, under preparation.

MAJOR HONORS & AWARDS

- **Best Student Paper Award Finalist**, Quality, Statistics and Reliability Section, 2025 INFORMS Annual Meeting, for the paper "Theoretical Analysis and Design of an Online Monitoring and Sampling Scheme Under Partial Observations", 2025
- **Best Student Paper Award Finalist**, Data Mining Society, 2024 INFORMS Annual Meeting, for the paper "A Bayesian Jump Model-based Pathwise Sampling Approach for Online Anomaly Detection", 2024
- **Best Referred Paper Award Finalist**, Quality, Statistics and Reliability Section, 2021 INFORMS Annual Meeting, for the paper "Data-driven Pathwise Sampling Approaches for Online Anomaly Detection", 2021
- **Data Challenge Competition Award Finalist,** Quality, Statistics and Reliability Section, 2021 INFORMS, for the competition "In-Situ Quality Process Monitoring in Additive Manufacturing", 2021
- **Feature Article** in Advances in Engineering, "Data-driven Pathwise Sampling Approaches for Online Anomaly Detection", 2024
- **Future Faculty Fellow**, Institute for Industrial and Systems Engineers (IISE), 2024
- **Best Paper Award**, Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling & International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering, for the paper "Statistical Inference for $M_t/G/Infinity$ Queueing Systems Under Incomplete Observations", 2018
- **National Scholarship**, Ministry of Education of China, 2019
- **Excellent Graduate**, Dalian University of Technology, 2017
- **Learning Excellence Award**, Dalian University of Technology, 2014, 2015, 2016
- **Hua Loo-Keng Scholarship**, Chinese Academy of Sciences, 2015
- **Technological Innovation Award**, Dalian University of Technology, 2015

RESEARCH EXPERIENCE

Modeling, monitoring, and adaptive routing of moving vehicle-based sensors
- Bayesian model incorporating spatial correlations for real-time status update and uncertainty quantification
- Online monitoring of a large area for quick anomaly detection and localization
- Adaptive route adjustment of moving sensors to suspicious locations based on real-time observations
- Determination of number of sensors for optimal statistical and economic performance through theoretical analysis of detection delay

Modeling and monitoring in additive manufacturing
- Physics-informed neural network to predict droplet evolution based on the Navier–Stokes equation and sequential droplet images

- Mixed effect model incorporating neural network to estimate global spatial profiles and spatial correlations
- Residual-based spatial exponentially weighted moving average statistics to quickly detect localized anomaly within layer before the full layer is produced

Machine learning for resource-constrained decision-making

- On-demand learning framework that integrates prediction and optimization to minimize misclassification cost under resource constraints
- Adaptively adjusted weight in loss function based on prediction results and resource constraints for minimal cost

Statistical inference for M_t/G/infinity queueing systems under incomplete observations

- Likelihood-based model parameter estimation under incomplete data
- Integration of Delta method and bootstrap method for interval estimation and prediction of vital performance measures in the queueing system

TEACHING EXPERIENCE

Instructor, ESI 6325 "Applied Probability Methods in Engineering", ISE Department, University of Florida, Fall 2022
- Graduate level, Master's core course (both on-campus and Electronic Delivery of Gator Engineering Program)
- My duties: Prepared and delivered lectures, designed and graded homework and exams, held office hours, mentored and evaluated term projects, and managed overall course instruction and logistics

Teaching Assistant, ESI 3327, "Matrix and Numerical Methods in Systems Engineering", ISE Department, University of Florida, Fall 2023
- Undergraduate level
- My duties: Graded homework and exams, held office hours, and led interactive homework sessions and MATLAB lab sessions

Teaching Assistant, EIN 6176, "Advanced Quality Management and Engineering for Business Processes", ISE Department, University of Florida, Fall 2023
- Graduate level, Outreach Engineering Management Master's Program
- My duties: Designed and graded homework and exams, and held office hours

Guest Lecture, ISYE 3039, "Methods for Quality Improvement", ISyE Department, Georgia Institute of Technology, Spring 2025
- Undergraduate level
- My duties: Prepared and delivered a lecture introducing statistical process control and demonstrating its applications

PRESENTATIONS

1. **Theoretical Analysis for Optimal Design of an Online Monitoring and Sampling Scheme Under Partial Observations**

- Best Student Paper Award Session of Quality, Statistics, and Reliability Section in INFORMS Annual Meeting, October 2025, Atlanta, GA.
- INFORMS Annual Meeting, October 2025, Atlanta, GA.
- IISE Annual Conference and Expo, June 2025, Atlanta, GA.

2. **On-Demand Machine Learning for Resource-Constrained Classification**
   - 20th INFORMS Data Mining and Decision Analytics Workshop, October 2025, Atlanta, GA.
   - INFORMS Annual Meeting, October 2025, Atlanta, GA.

3. **Within-layer In-situ Quality Monitoring of Additive Manufacturing Processes Along Tool Paths**
   - IISE Annual Conference and Expo, June 2025, Atlanta, GA.

4. **A Bayesian Jump Model-based Pathwise Sampling Approach for Online Anomaly Detection**
   - Best Student Paper Award Session of Data Mining Society in INFORMS Annual Meeting, October 2024, Seattle, WA.
   - INFORMS Annual Meeting, October 2024, Seattle, WA.

5. **Data-driven Pathwise Sampling Approaches for Online Anomaly Detection**
   - Best Referred Paper Award Session of Quality, Statistics, and Reliability Section in INFORMS Annual Meeting, October 2021, online.
   - INFORMS Annual Meeting, October 2022, Indianapolis, IN.

6. **Residual-based Control Chart for Additive Manufacturing Process Monitoring**
   - Data Challenge Competition Award Session in the 1st INFORMS Workshop on Quality, Statistics, and Reliability, October 2021, online.

7. **Statistical Inference for M_t/G/Infinity Queueing Systems Under Incomplete Observations**
   - The Fifth International Conference on the Interface between Statistics and Engineering, June 2019, Seoul, South Korea.
   - Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling & International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering, August 2018, Qingdao, China.

Poster Presentations

1. **Theoretical Analysis for Optimal Design of an Online Monitoring and Sampling Scheme Under Partial Observations**
   - INFORMS Annual Meeting, October 2025, Atlanta, GA.

2. **A Bayesian Jump Model-based Pathwise Sampling Approach for Online Anomaly Detection**
   - IISE Annual Conference and Expo, June 2025, Atlanta, GA.
   - Georgia Statistics Day, Emory University, October 2024, Atlanta, GA.
   - INFORMS Annual Meeting, October 2024, Seattle, WA.

3. **Data-driven Pathwise Sampling Approaches for Online Anomaly Detection**
   - INFORMS Annual Meeting, October 2022, Indianapolis, IN.
   - Nelms Institute 5th Anniversary, University of Florida, January 2022, Gainesville, FL.

PROFESSIONAL SERVICES & ACTIVITIES

Referee Services
- IEEE Transactions on Automation Science and Engineering
- International Conference on Automation Science and Engineering (CASE, 2022,2023)
- SN Operations Research Forum

Professional Membership
- Member of INFORMS, IISE, SME

Conference Organizing Activities
- Session Chair, "Data-Driven Modeling and Decision-Making for System Prediction and Monitoring", 2025 INFORMS Annual Meeting, October 2025, Atlanta, GA
- Session Chair, "Data Driven Analysis under Data Constraints", 2025 IISE Annual Conference and Expo, June 2025, Atlanta, GA
- Session Chair, "Complex System Modeling, Monitoring, and Decision-making", 2024 INFORMS Annual Meeting, October 2024, Seattle, WA

Professional Activities
- Judge, High School Students Research Poster Competition, Florida Regional Junior Science, Engineering, and Humanities Symposium (JSEHS), University of Florida, January 2023, Gainesville, FL.
- Judge, Poster Competition, The Society of Hispanic Professional Engineers (SHPE) x Herbert Wertheim College of Engineering (HWCOE) Engineering Research Symposium, April 2024, Gainesville, FL.
- Judge, InVenture Prize Preliminary Round, Georgia Institute of Technology, January 2025, Atlanta, GA.

References
- Dr. Xiaochen Xian (Advisor)
  Assistant Professor
  H. Milton Stewart School of Industrial and Systems Engineering
  Georgia Institute of Technology, Atlanta, GA, USA
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- Dr. Jianjun (Jan) Shi
  Carolyn J. Stewart Chair and Professor
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- Dr. Hongcheng Liu
  Associate Professor
  Industrial and Systems Engineering
  University of Florida, Gainesville, FL, USA
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- Dr. Xiao Liu
  David M. McKenney Family Associate Professor
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- Dr. Roshan Joseph
  A. Russell Chandler III Chair and Professor
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