

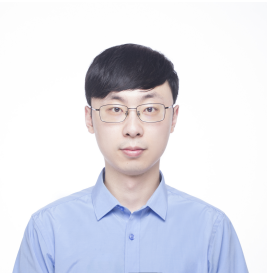
Jiaqi Luo

Assistant Professor

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ABOUT

I am a researcher in computational mathematics and machine learning. My research focuses on utilizing nonlinear optimization techniques and machine learning methods to develop simple, user-friendly, and computationally efficient models and algorithms with applications in industry, healthcare, and science.

1. Nonlinear Optimization: Sparse Optimization, Numerical Optimization
2. Machine Learning: Tabular Machine Learning, Imbalanced Learning, Label-noise Learning, Deep Learning, Multimodal Learning
3. Applications: AI for Science, Healthcare, Industry

EDUCATION

- Ph.D in Computational Mathematics, Advisor: [Zhouwang Yang](#)
Soochow University, 2015-2020
- B.S. in Mathematics,
Soochow University, 2011-2015

POSITIONS

- 2025.2 - present, Assistant Professor
School of Mathematical Sciences, Soochow University
- 2023.11 - 2024.11, Postdoctoral Fellowship, Advisor: [Huaxiong Huang](#), [Arvind Gupta](#)
The Fields Institute for Research in Mathematical Sciences
- 2020.7-2023.10, Research Scientist, Advisor: [Shixin Xu](#)
Data Science Research Center, Duke Kunshan University

PREPRINTS

1. **Jiaqi Luo**, Yuedong Quan, and Shixin Xu. Robust-GBDT: A Novel Gradient Boosting Model for Noise-Robust Classification. arXiv:2310.0506.
2. **Jiaqi Luo**, Yuan Yuan, and Shixin Xu. TIME: TabPFN-Integrated Multimodal Engine for Robust Tabular-Image Learning. arXiv:2506.00813.

PUBLICATIONS

1. **Jiaqi Luo**, Yahong Yang, Yuan Yuan, Shixin Xu, and Wenrui Hao. An Imbalanced Learning-based Sampling Method for Physics-informed Neural Networks. *Journal of Computational Physics* 534 (2025): 114010. [\[DOI\]](#)
2. **Jiaqi Luo**, Yuan Yuan, and Shixin Xu. Improving GBDT Performance on Imbalanced Datasets: An Empirical Study of Class-Balanced Loss Functions. *Neurocomputing* 634 (2025) : 129896. [\[DOI\]](#)
3. **Jiaqi Luo** and Shixin Xu. NCART: Neural Classification and Regression Tree for Tabular Data. *Pattern Recognition* 154 (2024): 110578. [\[DOI\]](#)
4. Zepeng Wen*, **Jiaqi Luo***, and Hongmei Kang. The deep neural network solver for B-spline approximation. *Computer-Aided Design* 169 (2024): 103668. (*: Equal Contribution) [\[DOI\]](#)
5. **Jiaqi Luo**, Zihao Wei, Junkai Man, and Shixin Xu. TRBoost: A Generic Gradient Boosting Machine based on Trust-region Method. *Applied Intelligence* 53 (2023): 27876-27891. [\[DOI\]](#)
6. **Jiaqi Luo**, Hongmei Kang, and Zhouwang Yang. Knot placement for B-spline curve approximation via $l_{\infty,1}$ -norm and differential evolution algorithm. *Journal of Computational Mathematics* 40(4) (2022): 592-609. [\[DOI\]](#)
7. **Jiaqi Luo**, Hongmei Kang, and Zhouwang Yang. Knot calculation for spline fitting based on the unimodality property. *Computer Aided Geometric Design* 73 (2019): 54-69. [\[DOI\]](#)

TEACHING

1. 2023.9-2023.10, Linear Algebra, Recitation Lecturer, Duke Kunshan University.
2. 2023.11-2023.12, Calculus, Teaching Assistant, Duke Kunshan University.
3. 2025.9-2026.1, Python Programming, Soochow University.
4. 2025.9-2026.1, Unstructured Data Analysis, Soochow University.

ENGINEERING PROJECTS

1. **Anomaly Detection System in Pipe Gallery Environment (2020)** Utilized time series analysis to predict changes in temperature, gas concentration, and other critical indicators in pipe galleries, enabling proactive maintenance and hazard prevention.
2. **DRAM Errors Detection (2021)** Employed machine learning and time series analysis to forecast the likelihood of uncorrectable errors in DIMMs, enhancing system reliability and preemptive error correction strategies.
3. **Hardware Health Monitoring (2022)** Applied machine learning and statistical algorithms to evaluate the health of hardware in high-performance computers, facilitating early detection of potential failures and ensuring product quality.
4. **Intelligent Dispensing System (2023)** Leveraged machine learning to predict optimal glue dispensing parameters, and implemented an learning-based methodology to strategically select and acquire data points.
5. **Medical Image Registration (2024)** Developed a deep learning-based framework to enhance the performance of wound image registration. This innovation significantly improved accuracy, leading to better monitoring and assessment of wound healing progress.