Sixu Li

Curriculum Vitae

Department of Statistics
University of Wisconsin-Madison
✉ *sli739@wisc.edu*
My Webpage
Github

Education

2021–2026 (expected) **Ph.D. in Statistics**, *University of Wisconsin-Madison*, Wisconsin, USA.
Advisors: Prof. Nicolás García Trillos (Statistics) and Prof. Qin Li (Math)

2019–2021 **Master in Statistics**, *University of Wisconsin-Madison*, Wisconsin, USA.

2015–2019 **Bachelor in Mathematics and Statistics**, *Nanjing University*, Nanjing, China.

Research Interests

My current research lies at the intersection of applied PDE analysis, numerical analysis, statistical learning theory, dynamical system, and machine learning, with a particular focus on **Interacting Particle Systems**, **Global Optimization**, **Multi-Agent-Based Learning**, and **Generative Modeling**.

Publications

Published

2025 Nicolás García Trillos, Aditya Kumar Akash, **Sixu Li**, Konstantin Riedl, and Yuhua Zhu. Defending Against Diverse Attacks in Federated Learning Through Consensus-Based Bi-Level Optimization. *Philosophical Transactions A*, 2025.

2024 José Antonio Carrillo, Nicolás Garcia Trillos, **Sixu Li**, and Yuhua Zhu. FedCBO: Reaching Group Consensus in Clustered Federated Learning through Consensus-based Optimization. *Journal of Machine Learning Research*, 2024.

Preprints

2024 Nicolás García Trillos, **Sixu Li**, Konstantin Riedl, and Yuhua Zhu. CB^{2}O: Consensus-Based Bi-level Optimization. *Preprint*, 2024. `https://arxiv.org/abs/2411.13394`.

2024 **Sixu Li**, Shi Chen, and Qin Li. A Good Score Does not Lead to A Good Generative Model. *Preprint*, 2024. `https://arxiv.org/abs/2401.04856`.

2022 Aditya Kumar Akash, **Sixu Li**, and Nicolas Garcia Trillos. Wasserstein Barycenter-based Model Fusion and Linear Mode Connectivity of Neural Networks. *Preprint*, 2022. `https://arxiv.org/abs/2210.06671`.

In Preparation

2025 Nicolás García Trillos, **Sixu Li**, Thomas Maranzatto, Jan Peszek, Konstantin Riedl, Trevor Teolis, and Sennur Ulukus. Low Dimensional Behavior of Transformer Dynamics. *in preparation*, 2025.

2025 **Sixu Li**, Ethan Hanold, Nicholas Boffi, Leonardo Zepeda-Núñez, and Qin Li. When Does Noise Help in Stochastic Interpolants: A Non-Asymptotic Analysis and Optimal Design. *in preparation*, 2025.

2025 Qin Li, **Sixu Li**, Eitan Tadmor, and Emmanuel Trélat. Optimal Optimizer for Non-Convex Optimization. *in preparation*, 2025.

Awards

2025 ***Student Travel Award***, SIAM Conference on Applications of Dynamical Systems, Denver, USA.

2024 ***Student Travel Award***, SIAM Conference on Mathematics of Data Science, Atalanta, USA.

Teaching Experience

Fall 2025 : STAT 303: R for Statistics I & STAT 628: Data Science Practicum (TA), UW-Madison

Spring 2025 : STAT 333: Applied Linear Regression (TA), UW-Madison

Fall 2024 : STAT 628: Data Science Practicum (TA), UW-Madison

Spring 2024 : STAT 615 : Statistical Learning (TA), UW-Madison

Fall 2023 : STAT 605 : Data Science Computing Project (TA), UW-Madison

Spring 2023 : STAT 615 : Statistical Learning (TA), UW-Madison

Fall 2022 : STAT 301 : Introduction to Statistical Methods (TA), UW-Madison

Spring 2022 : STAT 615 : Statistical Learning (TA), UW-Madison

Fall 2021 : STAT 312 : Introduction to Theory and Methods of Mathematical Statistics II (TA), UW-Madison

Mentoring

Summer Programs

2024 **The Letters & Science Summer of Excellence in Research (LASER) Program**, UW-Madison. Mentored three undergraduate students through summer research projects together with Prof. Nicolás García Trillos and Ph.D. student Yaling Hong.

Professional Activities

Workshop organizer

2025 **Mini-Symposium "*Collective Dynamics in Multi-Agent Systems: Advances in Learning and Optimization*"**, SIAM Conference on Applications of Dynamical Systems, Denver, USA. Jointly organized with Dohyeon Kim (Caltech), Claudia Totzeck (University of Wuppertal), Nicolás García Trillos (UW-Madison), Yuhua Zhu (UCLA).

2024 **Mini-Symposium "*Interacting Particle Systems in Data Science: From Theory to Applications*"**, SIAM Conference on On Mathematics of Data Science, Atalanta, USA.
Jointly organized with Konstantin Riedl (Oxford), Nicolás García Trillos (UW-Madison).

Reviewer

NeurIPS 2025, AISTATS 2025, ICML 2025, NeurIPS 2024.

Presentations

2025 **"Achieving Adversarial Robustness in Federated Learning with Consensus-Based Bi-Level Optimization"**, Workshop "Mathematical Analysis of Adversarial Machine Learning", Banff International Research Station.

2025 **"Consensus-Based Bi-Level Optimization and Robust Decentralized Federated Learning"**, Mini-Symposium "Collective Dynamics in Multi-Agent Systems: Advances in Learning and Optimization", SIAM Conference on Applications of Dynamical Systems.

2025 **"(Robust) Decentralized Clustered Federated Learning Through the Lens of Consensus-Based (Bi-level) Optimization"**, Level Set Meeting, UCLA.

2025 **"Personalized Federated Learning Through the Lens of Interacting Particle Systems"**, Industry Academic Research Discussion, Epic Systems Corporation.

2024 **"(Robust) Decentralized Clustered Federated Learning Through the Lens of Consensus-Based (Bi-level) Optimization"**, RSRG/FALCON Weekly Seminar, Caltech.

2024 **"(Robust) Decentralized Clustered Federated Learning Through the Lens of Consensus-Based (Bi-level) Optimization"**, Mini-Symposium "Particles Unleashed: From the Theory of Interacting Particle Systems to Applications in Optimization, Data Science, and Machine Learning", European Congress of Mathematics.

2024 **"A Good Score Does not Lead to A Good Generative Model"**, Mini-Symposium "Mathematical Foundations of Ensemble Kalman Methods", SIAM Conference on Uncertainty Quantification.

2024 **"A Good Score Does not Lead to A Good Generative Model"**, SIAM Student Seminar, UW-Madison.

2024 **"A Good Score Does not Lead to A Good Generative Model"**, IFDS Seminar, UW-Madison.

2023 **"Clustered Federated Learning from the Perspective of Interacting Particle Systems"**, Mini-Symposium "Efficient Optimization in High Dimensions", SIAM Conference on Optimization.

2023 **"Clustered Federated Learning from the Perspective of Interacting Particle Systems"**, IFDS Seminar, UW-Madison.

2022 **"Wasserstein Barycenter-based Model Fusion and Linear Mode Connectivity of Neural Networks"**, IFDS Seminar, UW-Madison.