Xin Wang

Ph.D. Student in Transportation Engineering

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Research Interests

Core AI Research

- Stability analysis and Lipschitz-like properties of Neural Networks
- Machine unlearning via variational inequalities and influence functions
- Adversarial robustness and transferability in spatiotemporal forecasting
- Scalable optimization methods (Hessian-vector products, low-rank updates)

Applications in Transportation Systems

- Cybersecurity in intelligent transportation (ITS)
- Robust traffic forecasting, signal control, and V2X communications

Education

2022–Present **Ph.D., Transportation Engineering**, *University of Washington*, Seattle, WA
Advisor: Prof. Xuegang (Jeff) Ban

2020–2022 **M.S., Statistics**, *Renmin University of China*, Beijing, China

2016–2020 **B.S., Applied Mathematics**, *Central South University*, Changsha, China

Research & Teaching

2022–Present **Research Assistant**, *University of Washington*, Seattle, WA

- Machine unlearning, adversarial robustness, and optimization for intelligent transportation systems.

Autumn 2024 **Teaching Assistant**, *CET 513: Optimization in Transportation, UW CEE*

- Lab sections, office hours, and grading.

Industry Experience

Jan–May 2021 **Machine Learning Engineer Intern**, *Baidu Inc.*, Beijing, China

- Multi-objective ranking optimization for online video search using Pareto-Efficient LTR (PE-LTR).
- Improved both NDCG and CTR; identified Pareto solutions with NSGA-II (fast non-dominated sorting, elitist MOEA).

Selected Publications

Core AI Contributions

Set-Valued Sensitivity Analysis of Deep Neural Networks
Xin Wang, Feilong Wang, Xuegang Jeff Ban.
Proceedings of the AAAI Conference on Artificial Intelligence, 39(20) (2025): 21304–21311.

Machine Unlearning of Traffic State Estimation and Prediction
Xin Wang, R. Tyrrell Rockafellar, et al.
arXiv:2507.17984 (2025). Submitted to ISTTT.

Model-Targeted Data Poisoning Attacks against ITS Applications with Provable Convergence
Xin Wang, Feilong Wang, Yuan Hong, R. Tyrrell Rockafellar, et al.
arXiv:2505.03966 (2025). Submitted to AAAI.

Applications in Transportation Systems

Data poisoning attacks on traffic state estimation and prediction
Wang, Feilong, Xin Wang, Hong, Yuan, Rockafellar, R. Tyrrell, Ban, Xuegang Jeff.
Transportation Research Part C, 168 (2024): 104577.

Data poisoning attacks in intelligent transportation systems: A survey
Wang, Feilong, Xin Wang, Ban, Xuegang Jeff.
Transportation Research Part C, 165 (2024): 104750.

Infrastructure-enabled Defense Methods against Data Poisoning Attacks on Traffic State Estimation and Prediction
Feilong Wang, Xin Wang, Jeff Ban.
Conference in Emerging Technologies in Transportation Systems (TRC-30), 2025.

Transferability in Data Poisoning Attacks on Spatiotemporal Traffic Forecasting Models
Xin Wang, Feilong Wang, Yuan Hong, Xuegang Ban.
SSRN 4827065 (2024). Submitted to *Transportation Research Part C*.

Invited Talks & Guest Lectures

Jan 2025 **Data Poisoning Attacks on Traffic State Estimation and Prediction**
ISTTT 2025

June 2024 **A Review of Data Poisoning Attacks in Intelligent Transportation Systems**
TRB 2025

Academic Service

Reviewer: Transportation Research Part C, TRB Annual Meeting, AAAI Conference on Artificial Intelligence