Xingmin Wang

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Education

2018.8 – 2023.8	**Ph.D., Civil Engineering and Scientific Computing**, *University of Michigan, Ann Arbor*, "Traffic Signal Optimization with Connected Vehicle Trajectories", Advised by Dr. Henry Liu, GPA: 4.0/4.0, A+ in almost half of courses
2014.9 – 2018.7	**B.Eng., School of Vehicle and Mobility**, *Tsinghua University, Beijing, China*, Major in Automotive Engineering (89.0/100), Rank Top 5%

Work Experiences

Academic Experiences

2023.9 – Pre	**Postdoctoral Research Fellow, Civil Engineering**, *University of Michigan, Ann Arbor*, Supervisor: Dr. Henry Liu
2023.9 – 2024.1	**Adjunct Lecturer, Civil Engineering**, *University of Michigan, Ann Arbor*, Co-teach CEE 551 Traffic Science with Dr. Henry Liu

Industrial Experiences

2017.9 – 2018.8	**Didi Chuxing, Smart Transportation**, *Beijing, China*, Algorithm Intern, Mentor: Dr. Henry Liu, Dr. Jianfeng Zheng. We work on optimizing traffic signals using vehicle trajectory data.

Research Interests

My research interests include traffic flow theory, traffic network modeling, traffic control, and urban computing, particularly with connected and automated transportation. My research works are founded on a variety of methodologies including statistical inference, network science, machine learning, and optimization. I have extensive experience in the processing, mining, and visualization of geospatial data such as traffic road networks and vehicle trajectories.

Honors & Awards

2019	Department Fellowship, Civil Engineering, University of Michigan
2017	The First Prize in 35th Tsinghua University Academic Challenge Cup
2015 – 2017	Fellowship of Siyuan Programme, Tsinghua University
2017	Infeneon Technology Scholarship, Tsinghua University
2016	Outstanding Project of Undergraduate Research Competition, Tsinghua University
2015	The First Prize in National Physics Contest for College Student

Publications

[1] Xingmin Wang, Zachary Jerome, Zihao Wang, Chenhao Zhang, Shengyin Shen, Vivek Vijaya Kumar, Fan Bai, Paul Krajewski, Danielle Deneau, Ahmad Jawad, Rachel Jones, Gary Piotrowicz, Henry X Liu. "Traffic light optimization with low penetration rate vehicle trajectory data". *Nature Communications*, Accepted

[2] Yu Han, Zhe Han, Fan Ding, Fuliang Li, Hao Wang, <u>Xingmin Wang</u>*. "Field-tested signal controller to mitigate spillover using trajectory data". *Computer-Aided Civil and Infrastructure Engineering*, 2023 [DOI] *: Co-correspondence

[3] Xinyu Fei, <u>Xingmin Wang</u>, Xian Yu, Yiheng Feng, Henry X. Liu, Siqian Shen, Yafeng Yin. "Traffic Signal Control under Stochastic Traffic Demand and Vehicle Turning via Decentralized Decomposition Approaches". *European Journal of Operational Research (EJOR)* 310 (2), 712-736, 2023 [DOI]

[4] <u>Xingmin Wang</u>, Yafeng Yin, Yiheng Feng, Henry X. Liu. "Learning the max pressure control for urban traffic networks considering the phase switching loss". *Transportation Research Part C: Emerging Technologies (TR part C)* 140, 103670. 2022 [DOI]

[5] <u>Xingmin Wang</u>, Zachary Jerome, Chenhao Zhang, Shengyin Shen, Vivek Vijaya Kumar, Henry X Liu. "Trajectory Data Processing and Mobility Performance Evaluation for Urban Traffic Networks". *Transportation Research Record (TRR)* 2677 (3), 355-370, 2022 [DOI]

[6] Zachary Jerome, <u>Xingmin Wang</u>, Shengyin Shen, Henry X Liu. "Determining Yellow Change and Clearance Intervals for Left-Turning Phases: Evaluation of the Current Guidelines with Connected Vehicle Data". *Transportation Research Record (TRR)*, 2676 (11), 1-14, 2022 [DOI]

[7] <u>Xingmin Wang</u>, Shengyin Shen, Debra Bezzina, James R Sayer, Henry X Liu, Yiheng Feng. "Data Infrastructure for Connected Vehicle Applications". *Transportation Research Record (TRR)*, 2674 (5), 85-96, 2020 [DOI]

[8] Yan Zhao, Jianfeng Zheng, Wai Wong, <u>Xingmin Wang</u>, Yuan Meng, Henry X Liu. "Estimation of queue lengths, probe vehicle penetration rates, and traffic volumes at signalized intersections using probe vehicle trajectories". *Transportation Research Record (TRR)*, 2673 (11), 660-670, 2019 [DOI]

[9] Yan Zhao, Jianfeng Zheng, Wai Wong, <u>Xingmin Wang</u>, Yuan Meng, Henry X Liu. "Various methods for queue length and traffic volume estimation using probe vehicle trajectories". *Transportation Research Part C: Emerging Technologies (TR part C)*. 107, 70-91, 2019 [DOI]

[10] Shuo Feng, <u>Xingmin Wang</u>, Haowei Sun, Yi Zhang, Li Li. "A better understanding of long-range temporal dependence of traffic flow time series". *Physica A: Statistical Mechanics and its Applications*. 492, 639-650, 2018 [DOI]

[11] Shuo Feng, Ruimin Ke, <u>Xingmin Wang</u>, Yi Zhang, Li Li. "Traffic flow data compression considering burst components". *IET Intelligent Transport Systems*. 11 (9), 572-580, 2017 [DOI]

Patents

[1] Henry Liu, <u>Xingmin Wang</u>, Zachary Jerome, Shengyin Shen, and Zihao Wang. "Optimizing Traffic Signals Using Partially Observed Vehicle Trajectory Data". *US provisional patent application 18/308,996*. Filed on April 28, 2023.

Student Mentorship

Chenhao Zhang (master student, UofM, Computer Science), now at CMU, 2021-2023

Saiyu Zhang (master student, UofM, Civil Engineering), 2021-2022

Kechen Zhu (master student, UofM, Civil Engineering), 2021-2022

Professional Services

2022 – 2024 **Editorial Assistant**, Journal of Intelligent Transportation Systems

2023	**Conference secretariat**, 25th International Symposium on Transportation and Traffic Theory (ISTTT 25).
2020 – 2022	**Vice President**, Michigan Transportation Student Organization (MiTSO)
Reviewer of	TR part C, Transportation Science, IEEE ITS, Automotive Innovation, etc.

Teaching

2023 Fall	Co-Instructor for CEE 551: Traffic Science (Q1: 4.6/5.0 Q2: 4.9/5.0)
2022 Fall	Co-Instructor for CEE 551: Traffic Science
2020 Winter	Graduate Student Instructor for CEE 450: Introduction to Transportation Engineering

Presentations and Posters

2024	"Traffic light optimization with low penetration rate vehicle trajectories", Poster at *TRB Annual Meeting, Washington, D.C.*
2022	"Learning the max pressure control for urban traffic networks", Presented at *2022 INFORMS Annual Meeting, Indianapolis*
2021	"Max-Weight Control for Urban Traffic Networks Considering Phase Switching Loss", Poster at *100th TRB Annual Meeting, Washington, D.C.*
2021	"Data Infrastructure for Connected Vehicle Applications", Presentation at *99th TRB Annual Meeting, Washington, D.C.*