



Yihuai Zhang

Doctor of Philosophy
in Intelligent Transportation
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RESEARCH INTERESTS

Theory: Boundary control of distribute parameter systems, stochastic **partial differential equations(PDEs)**, theoretical-guaranteed machine learning methods(**neural operators**), learning-based control for dynamical systems.

Applications: Intelligent transportation systems, traffic flow control on macroscopic levels.

EDUCATION

The Hong Kong University of Science and Technology(Guangzhou) <i>Ph.D. in Intelligent Transportation</i>	Sep 2022 – Now GPA 4.1/4.3
South China University of Technology <i>M.S. in Vehicle Engineering</i>	Sep 2019 – June 2022 Average score 88/100
Southwest University <i>B.Eng in Vehicle Engineering</i>	Sep 2015 – June 2019 Average score 86/100

PUBLICATIONS

Journal Papers

Yihuai Zhang, Huan Yu, Jean Auriol, Mike Pereira. “Mean-Square Exponential Stabilization of Mixed-Autonomy Traffic PDE System.” **Automatica**, 2024, 170: 111859. (Regular paper)

Yihuai Zhang, Ruiguo Zhong, and Huan Yu. “Mitigating Stop-and-Go Traffic Congestion with Operator Learning.” **Transportation Research Part C: Emerging Technologies**, 2025, 170: 104928.

Yihuai Zhang, Jean, Auriol, Huan Yu. “Operator Learning for Robust Stabilization of Linear Markov-Jumping Hyperbolic PDEs.” **Automatica**, Under Review, 2025.

Yihuai Zhang, Huan Yu. “Event-Triggered Control of Congested Mixed-Autonomy Traffic.” **IEEE Transactions on Intelligent Transportation Systems (T-ITS)**, Under Review, 2025.

Ziming Wang, **Yihuai Zhang**, et al., “Adaptive Event-Triggered Formation Control of Autonomous Vehicles.” **IEEE Transactions on Intelligent Transportation Systems (T-ITS)**, Under Review, 2025.

K Lv, J Wang, **Yihuai Zhang** et al., “Neural Operators for Adaptive Control of Freeway Traffic.” **Automatica**, Under Review, 2025.

Yihuai Zhang, et al., “Low-speed Vehicle Path-Tracking Algorithm Based on Model Predictive Control Using QPKWIK Solver.” **Journal of Dynamic Systems, Measurement, and Control** 143.12 (2021): 121003.

Conference Papers

Yihuai Zhang, Ruiguo Zhong, and Huan Yu. “Neural Operators for Boundary Stabilization of Stop-and-Go Traffic.” 6th Annual Learning for Dynamics & Control Conference (L4DC). PMLR, 2024.

Yihuai Zhang, Jean Auriol, and Huan Yu. “Robust Boundary Stabilization of Stochastic Hyperbolic PDEs.” 2024 American Control Conference (ACC). IEEE, 2024.

Yihuai Zhang, and Huan Yu. “Event-Triggered Boundary Control of Mixed-Autonomy Traffic.” 2024 IEEE 63rd Conference on Decision and Control (CDC). IEEE, 2024.

Yihuai Zhang, Jean Auriol, and Huan Yu. “Neural-Operator Control for Traffic Flow Models with Stochastic Demand.” 5th IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE 2025). 2025.

K Lv, J Wang, **Yihuai Zhang** et al., “Neural Operators for Adaptive Control of Traffic Flow Models.” 5th IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE 2025). 2025.

INVITED TALKS

Neural-Operator Control for Traffic Flow Models with Stochastic Demand, <i>Oral</i>	2025
5th IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE 2025), Beijing, China	
Neural Operators for Adaptive Control of Traffic Flow Models, <i>Oral</i>	2025
5th IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE 2025), Beijing, China	
Learning for Dynamics and Control of Mobility Systems (III)–Learning-based Traffic Control, <i>Oral</i>	2025
Summer School of CPDE 2025, Beijing, China	
Operator Learning for Robust Stabilization of Linear Markov-Jumping Hyperbolic PDEs, <i>Oral</i>	2025
2025 International Annual Conference on Complex Systems and Intelligent Science (CSIS-IAC 2025), Shenzhen, China	
Event-Triggered Boundary Control of Mixed-Autonomy Traffic, <i>Oral</i>	2024
2024 Conference on Decision and Control (CDC 2024), Milan, Italy	
Neural Operators for Boundary Stabilization of Stop-and-Go Traffic, <i>Poster</i>	2024
6th Annual Learning for Dynamics & Control Conference, Oxford, United Kingdom	
Robust Boundary Stabilization of Stochastic Hyperbolic PDEs, <i>Oral</i>	2024
2024 American Control Conference (ACC), Toronto, Canada	
Mean-Square Exponential Stabilization of Mixed-Autonomy Traffic PDE System, <i>Oral</i>	2024
Joint International Conference on “Automation-Intelligence-Safety” & “International Symposium on Autonomous Systems” (ICAIS&ISAS), Chongqing, China	
Impact of Connected Automated Vehicle Platooning On Mixed Lane-Free Traffic, <i>Poster</i>	2023
The 27th International Conference of Hong Kong Society for Transportation Studies (HKSTS), Hong Kong, China	

TEACHING EXPERIENCE

INTR 6000G: Traffic Flow Theory <i>Teaching assistant</i>	Fall 2023
Intelligent Transportation Thrust, HKUST(GZ)	
Led office hours and gave feedback and comments for weekly readings and in-class discussions. Contributed to the design and grading of assignments.	
INTR 5300: Nonlinear Control System <i>Teaching assistant</i>	Spring 2024
Intelligent Transportation Thrust, HKUST(GZ)	
Led weekly sections and office hours. Contributed to the design and grading of weekly assignments as well as the final exam.	

MENTORSHIP

Ziming Wang (Mphil student, HKUST(GZ))	Aug 2024 - May 2025
Project: Adaptive Event-Triggered Formation Control of Autonomous Vehicles (Paper submitted to T-ITS)	
Kaijing Lv (Visiting PhD student, Beijing Institute of Technology)	Mar 2024 - Sep 2024
Project: Neural Operators for Adaptive Control of Freeway Traffic (Paper submitted to Automatica)	
Ruiguo Zhong (PhD Student, HKUST(GZ))	Sep 2023 - Jan 2024
Project: Mitigating Stop-and-Go Traffic Congestion with Operator Learning (Paper published in TRC)	

ACADEMIC SERVICES

Served as the reviewers of

Peer-reviewed journals: Automatica, IEEE Transactions on Automatic Control, System & Control Letters, IEEE Transactions on Intelligent Transportation Systems (T-ITS), IEEE Transactions on Cybernetics, International Journal Of Adaptive Control And Signal Processing, Engineering Applications of Artificial Intelligence, IEEE Transactions on Vehicular Technology

Peer-reviewed conferences: American Control Conference (ACC), Conference on Decision and Control (CDC), Learning for Dynamics and Control Conference (L4DC), IFAC Workshop on Control of Systems Governed by Partial Differential Equations (CPDE)

TECHNICAL SKILLS

English Proficiency: IELTS (7.0), CET-6 (508)

Programming Languages: Python, MATLAB

Tools and Frameworks: PyTorch, Tensorflow, Linux