Yongqi Dong

https://yongqidong.github.io/

Research Group Leader and Senior PostDoc Researcher (TV-L E-14.2) @ RWTH Aachen University

Guest Scholar @ Delft University of Technology

Chair of IEEE ITSS Technical Committee on Automated Mobility in Mixed Traffic

Leading Guest Editor for Special Issue on *AI-Empowered AVs in Mixed Traffic* in IEEE T-ITS

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EDUCATIONAL BACKGROUND

Doctor of Philosophy, Department of Transport & Planning, **Delft University of Technology (TU Delft)** Jan.2020-May.2025

Thesis: *Safe, Efficient, and Socially Compliant Automated Driving: Sensing, Anomaly Detection, Planning and Control*

Advisors: Prof.dr.ir. Bart van Arem and Dr.ir. Haneen Farah

Visiting PhD Researcher, Department of Mechanical Engineering, **University of California, Berkeley** May.2023-Oct.2023

Topic: *Towards Socially Compliant Automated Driving Modelling and Conceptual Design*

Advisor: Prof. Masayoshi Tomizuka (*Life Fellow of IEEE and ASME; Fellow of the IFAC*)

Master of Control Science and Engineering, Department of Automation, **Tsinghua University** Sep.2014-Jul.2017

Minor: Master Project for Improving Ability in *Data Science and AI*

Thesis: *Data-Driven Analysis on Group Behaviors of Taxi Drivers and Ridesourcing Drivers*

Nominated for Tsinghua University Outstanding Master's Thesis Dissertation

Advisors: Prof. Li Li (*IEEE Fellow*) and Prof. Zuo Zhang

Bachelor of Telecommunication Engineering Sep.2010-Jul.2014

School of Electronic and Information Engineering, **Beijing Jiaotong University**

GPA: 91.5/100 | Rank: 1/202 | Postgraduate Recommendation to Tsinghua University without Examination

Thesis: *Design of vehicle-mounted data acquisition & communication unit for the WMN-based locomotive remote control*

Outstanding Undergraduate Thesis

PUBLICATIONS

*(Google Scholar ID: L2kD-DwAAAAJ. The superscript # indicates equal contribution, * indicates corresponding authors.)*

Selected Key Journal Publications:

- 1. **Dong, Y.**, Farah, H., & Van Arem, B. (2025). Towards Developing Socially-Compliant Automated Vehicles: Advances, Expert Insights, and a Conceptual Framework. *Communications in Transportation Research*, *5*, 1-23. https://doi.org/10.1016/j.commtr.2025.100207 **[Top Q1**, ***IF*: 14.5, *SJR*: 2.836, *CiteScore*: 19.9]**. Accepted by the 104th TRB Annual Meeting (TRB 2025) for presentation, and **presented** at *the 4th Symposium on Management of Future Motorway and Urban Traffic Systems (MFTS)*
- 2. **Dong, Y.**, Patil, S., Van Arem, B., & Farah, H. (2023). A Hybrid Spatial-temporal Deep Learning Architecture for Lane Detection. *Computer-Aided Civil and Infrastructure Engineering*, *38*(1), 67-86. https://doi.org/10.1111/mice.12829 **[Top Q1**, ***IF*: 9.1, *SJR*: 2.972, *CiteScore*: 17.4]**
- 3. **Dong, Y.**, Wang, S., Li, L., Zhang, Z. (2018). An Empirical Study on Travel Patterns of Internet Based Ride-Sharing. *Transportation Research Part C: Emerging Technologies*, *86*, 1-22. https://doi.org/10.1016/j.trc.2017.10.022 **[Highly cited**; **Top Q1**, ***IF*: 7.9, *SJR*: 2.86, *CiteScore*: 15.9]**
- 4. Li, R.#, & **Dong, Y.**#,*(2023). Robust Lane Detection Through Self Pre-Training With Masked Sequential Autoencoders and Fine-Tuning With Customized PolyLoss. *IEEE Transactions on Intelligent Transportation Systems*, *24*(12). 14121-14132. https://doi.org/10.1109/TITS.2023.3305015 (Joint first author and corresponding author) **[Top Q1**, ***IF*:8.4, *SJR*:2.58, *CiteScore*: 17.8]**

- 5. **Dong, Y.**[#,*], Zhang, L.[#], Farah, H., Zgonnikov, A., & Van Arem, B. (2025). Data-driven Semi-supervised Machine Learning with Safety Indicators for Abnormal Driving Behavior Detection. *Transportation Research Record: Journal of the Transportation Research Board*, *2679*(5), 319-334. https://doi.org/10.1177/03611981241306752
- 6. **Dong, Y.**[#,*], Lu, X.[#], Li, R., Song, W., Van Arem, B., & Farah, H. (2025). Intelligent Anomaly Detection for Lane Rendering Using Transformer with Self-Supervised Pre-Training and Customized Fine-Tuning. *Transportation Research Record: Journal of the Transportation Research Board*, *2679*(8), 233-248. https://doi.org/10.1177/03611981251333341 (**accepted** by and presented at TRB 2024)
- 7. Farah, H., Postigo, I., Reddy, N., **Dong, Y.**, Rydergren, C., Raju, N., & Olstam, J. (2022). Modeling Automated Driving in Microscopic Traffic Simulations for Traffic Performance Evaluations: Aspects to Consider and State of the Practice. *IEEE Transactions on Intelligent Transportation Systems*, *24*(6), 6558-6574. https://doi.org/10.1109/TITS.2022.3200176 **[Top Q1, IF:8.4, SJR:2.58, CiteScore: 17.8]**
- 8. Berge, S. H., De Winter, J., Dodou, D., Afghari, A. P., Papadimitriou, E., Reddy, N., **Dong, Y.**, Raju, N., & Farah, H. (2025). Understanding Cyclists' Perception of Driverless Vehicles through Eye-Tracking and Interviews. *Transportation Research Part F: Traffic Psychology and Behaviour*, *109*, 399-420. https://doi.org/10.1016/j.trf.2024.11.015 **[Top Q1**, ***IF*:4.4, *SJR*:1.262, *CiteScore*: 7.0**]**
- 9. Liu, W., Song, L., **Dong, Y.**, Zhang, X., & Xu, L. (2025). Unified Model Predictive Control Method of Automated Vehicles for Lane Changing and Lane Keeping Maneuvers. *Journal of Intelligent Transportation Systems*, 1-21. https://doi.org/10.1080/15472450.2025.2479235
- 10. Lingam, S. N., De Winter, J., **Dong, Y.**, Tsapi, A., Van Arem, B., & Farah, H. (2024). eHMI on the Vehicle or on the Infrastructure? A Driving Simulator Study. *European Journal of Transport and Infrastructure Research*, *24*(2), 1–24. https://doi.org/10.59490/ejtir.2024.24.2.7273
- 11. Raju, N., Schakel, W., Reddy, N., **Dong, Y.**, & Farah, H. (2022). Car-Following Properties of a Commercial Adaptive Cruise Control System: A Pilot Field Test. *Transportation Research Record: Journal of the Transportation Research Board*, *2676*(7), 128-143. https://doi.org/10.1177/03611981221077085

Selected Key Conference Proceeding Publications & Presentations:

- 1. Huang, Y.[#], **Dong, Y.**[#,*], Tang, Y.*, & García-Hernandez, A. (2025). A Self-Supervised Transformer for Unusable Shared Bike Detection. **Accepted** by the *2025 IEEE International Conference on Intelligent Transportation Systems (ITSC 2025)*, Preprint
- 2. **Dong, Y.**, Liu, C., Wang, Y., & Fu, Zh. (2024). Towards Understanding Worldwide Cross-cultural Differences in Implicit Driving Cues: Review, Comparative Analysis, and Research Roadmap. *2024 IEEE 27th International Conference on Intelligent Transportation Systems (ITSC)*, Edmonton, AB, Canada, 2024, pp. 1569-1575. http://dx.doi.org/10.1109/ITSC58415.2024.10919561
- 3. Huang, Y.[#], **Dong, Y.**[#,*], Tang, Y., & Li, L. (2024). Leverage Multi-source Traffic Demand Data Fusion with Transformer Model for Urban Parking Prediction. **Accepted** and presented at *the 28th International Conference of Hong Kong Society For Transportation Studies (HKSTS 2024)* and accepted by *the Conference in Emerging Technologies in Transportation Systems (TRC-30)* for presentation, Preprint
- 4. Zhang, L.[#], **Dong, Y.**[#,*], Farah, H., & Van Arem, B. (2023). Social-aware Planning and Control for Automated Vehicles based on Driving Risk Field and Model Predictive Contouring Control: Driving through Roundabouts as a Case Study. *2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, Honolulu, Oahu, HI, USA, 2023, pp. 3297-3304. http://dx.doi.org/10.1109/SMC53992.2023.10394462. (Co-first author and corresponding author, accepted and presented at *TRB's 2023 Automated Road Transportation Symposium*), Demo video
- 5. **Dong, Y.**, Detema, T., Wassenaar, V., Van de Weg, J., Kopar, T., & Suleman, H. (2023). Comprehensive Comparison of Deep Reinforcement Learning for Automated Driving on Various Driving Maneuvers with Simulation. *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)*, Bilbao, Spain, 2023, pp. 6165-6170, http://dx.doi.org/10.1109/ITSC57777.2023.10422159

- 6. **Dong, Y.**[#,*], Patil, S.[#], Farah, H, & Hellendoorn, J. (2023). Sequential Neural Network Model with Spatial-Temporal Attention Mechanism for Robust Lane Detection Using Multi Continuous Image Frames (**Presented** at *the Transportation Research Board (TRB) 102nd annual meeting TRB 2023*). TRBAM-23-04409 poster
- 7. Yuan, H., Li, P., Van Arem, B., Kang, L., Farah, H., & **Dong, Y.**[*] (2023). Safe, Efficient, Comfort, and Energy-saving Automated Driving through Roundabout Based on Deep Reinforcement Learning. *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)*, Bilbao, Spain, 2023, pp. 6074-6079, http://dx.doi.org/10.1109/ITSC57777.2023.10422488 (Corresponding author and PI)
- 8. Xue, C.[#], **Dong, Y.**[#], Liu, J.[*] , Liao, Y., & Li, L. (2023). Design of the Reverse Logistics System for Medical Waste Recycling Part I: System Architecture and Disposal Site Selection Algorithm. *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)*, Bilbao, Spain, 2023, pp. 1741-1746, http://dx.doi.org/10.1109/ITSC57777.2023.10422624 (Co-first author)
- 9. Xue, C.[#], **Dong, Y.**[#], Liu, J.[*] , Liao, Y., & Li, L. (2023). Design of the Reverse Logistics System for Medical Waste Recycling Part II: Route Optimization with Case Study under COVID-19 Pandemic. *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)*, Bilbao, Spain, 2023, pp. 4011-4017. http://dx.doi.org/10.1109/ITSC57777.2023.10422236 (Co-first author)
- 10. **Dong, Y.**[*], Chen, K., Peng, Y., & Ma, Z. (2022). Comparative Study on Supervised versus Semi-supervised Machine Learning for Anomaly Detection of In-vehicle CAN Network. *2022 IEEE 25th International Conference on Intelligent Transportation Systems (ITSC)*, 2022, pp. 2914-2919. https://doi.org/10.1109/ITSC55140.2022.9922235
- 11. **Dong, Y.**, Yang, Z., Yue, Y., Pei, X., & Zhang, Z. (2018). Revealing Travel Patterns of Sharing-bikes in a Spatial-temporal Manner Using Non-negative Matrix Factorization Method. In *CICTP 2018: Intelligence, Connectivity, and Mobility* (pp. 1665-1674). Reston, VA: American Society of Civil Engineers. https://doi.org/10.1061/9780784481523.165
- 12. Yue, Y., Pei, X., Yang, Z., **Dong, Y**., & Yao, D. (2018). A Trip Building and Chaining Methodology Using Traffic Surveillance Data. In *CICTP 2018: Intelligence, Connectivity, and Mobility* (pp. 2254-2262). Reston, VA: American Society of Civil Engineers. https://doi.org/10.1061/9780784481523.224
- 13. **Dong, Y.**, Zhang, Z., Fu, R., Xie, N. (2016). Revealing New York Taxi Drivers' Operation Patterns Focusing on the Revenue Aspect. (2016) In *12th World Congress* on *Intelligent Control and Automation (WCICA)*, (pp. 1052-1057). IEEE. https://doi.org/10.1109/WCICA.2016.7578771

Under Review and Working Papers:

- 1. Patil, S.[#], **Dong, Y.**[#,*], Farah, H, & Hellendoorn, J. (2026). Efficient Sequential Neural Network based on Spatial-Temporal Attention and Linear LSTM for Robust Lane Detection Using Multi-frame Images. (Joint first author and corresponding author, ***Under Review*** by *IEEE Transactions on Intelligent Transportation Systems*), Preprint
- 2. **Dong, Y.**, Saadeh, B., Kemper, D., & García-Hernandez, A. (2026). Developing Socially Compliant Automated Vehicles in Mixed Traffic: Findings from A Questionnaire Survey. *To be submitted* to *Transportation Research Part F: Traffic Psychology and Behaviour.*
- 3. **Dong, Y.**[#,*], Reyna, C.F.[#], Klunder, G., Liao, F., & Rasouli, S. (2026). Benchmarking Emerging and Established Traffic Microsimulation Platforms for Dynamic Speed Limit Applications: A Comparative Study on Dutch Motorways. (Joint first author, corresponding author; *Under journal review* | **Accepted** by the *29th International Conference of Hong Kong Society for Transportation Studies*)
- 4. Zhang, Y.[#], **Dong, Y.**[#,*], Evans, C., Rinaldi, M., Shyrokau, B., & Farah, H. (2025). Cooperative Planning and Control for Connected and Automated Vehicles' On-ramp Merging in Mixed Traffic via Value Decomposition-based Multiagent Deep Reinforcement Learning. (Joint first author, corresponding author; *Under journal review* | **Accepted** by the *29th International Conference of Hong Kong Society for Transportation Studies*)
- 5. Ji, J., Lu, R., Belkessa, L., Wang, L., Varotto, S., **Dong, Y.**, Saunier, N., Ameli, M., Macfarlane, G., Madadi, B., & Wu, C. (2025). Exploring Artifacts Availability in Transportation Research Using Large Language Models. Under review

by *Transportation Research Part C: Emerging Technologies*, **accepted** by and **presented** at the *2025 Transportation Research Symposium (TRS)*, *2025 International Symposium on Transportation Data & Modelling (ISTDM)*, and *2025 Modelling Mobility Conference (MoMo)*.

- 6. Huang, Y., **Dong, Y.***, Tang, Y., & Li, L. (2025). Parking Availability Prediction via Fusing Multi-Source Data with A Self-Supervised Spatio-Temporal Inverted Transformer. (*Under Review* by *Transportation Research Part E: Logistics and Transportation Review*) Preprint
- 7. Zhang, Y., **Dong, Y.*** (2025). Optimization of coordinated flow restriction and skip-stopping schemes for urban rail stations considering platform carrying capacity (**Presented** at *the Transportation Research Board (TRB) 102nd annual meeting, TRB 2023*, *Under Review by Journal of Railway Science*). TRBAM-23-04413 poster, Preprint
- 8. The Age of Smart Integrated Transportation: Practice in the Digital Transformation of Transportation Industry [M]. *Publishing House of Electronics Industry*. [Involved as **reviewer** and **expert editor** for Preface, Chapters 1 & 13]

Open resource repository:

- Datasets, Simulation Platforms, and Relevant Publications on Emerging Mixed Traffic of AVs and HDVs
- List of (**10**) open datasets and codes: https://data.4tu.nl/search?search=Yongqi+Dong

PATENTS & SOFTWARE COPYRIGHTS

✧ ***European and Dutch Patent:***

- **Dong, Y**., & Li, R. (2024). Automated Lane Detection (Dutch Patent No. NL2033551). Netherlands: Netherlands Patent Office.
- **Dong, Y**., Zhang, L., Farah, H., & Van Arem, B. (2025). Socially-compliant Automated Driving in Mixed Traffic (Dutch Patent No. NL2035943). Netherlands: Netherlands Patent Office.

✧ ***Chinese Invention Patent:***

- Ruan, H., **Dong, Y.**, Wang, W., & Wang, F. (2016). Intelligent Demonstration Instrument of Simple Harmonic Oscillation Composition and Five Polarization States of Light (Chinese Patent No. CN103236211B). China: China National Intellectual Property Administration.

✧ ***Software copyright:***

- Spatial-Temporal Attention Integrated Sequential Neural Network Model for Vision-based Robust Lane Detection (i-DEPOT 142731, **approved & registered**)
- Vision-Based Lane Detection System with Self-supervised Pre-training Through Masked Sequential Auto-encoders (Computer Software Copyright Registration in China, 2024SR1350911, **approved & registered**)

ACADEMIC SERVICES

Guest Editor (Special Issue) | IEEE Transactions on Intelligent Transportation Systems Sep.2025-Present
Special Issue in IEEE Transactions on Intelligent Transportation Systems:
AI-Empowered Automated Driving in Mixed Traffic: From Sensing, Perception, to Planning and Control

Ambassador | IEEE Western European Students and Young Professionals (WESYP) 2025 Jul.2025-Present

Technical Committee (Chair) | Automated Mobility in Mixed Traffic | IEEE ITSS Mar.2025-Present
Establishing and chairing the interdisciplinary community: "Automated Mobility in Mixed Traffic"

IEEE ITSS New Initiatives Project Principal Investigator (PI) | IEEE ITSS Mar.2024-Mar.2025
Project: *Promoting interdisciplinary research toward the deployment of automated vehicles in mixed traffic*

Workshop Organizer (Primary coordinator) | 28th IEEE ITSC 2025, Gold Coast, Australia Sep.24, 2024
Workshop title: Automated Mobility in Mixed Traffic: *Emerging Mixed Autonomy in the Era of AI*

Workshop Organizer (Primary coordinator) | 27th IEEE ITSC 2024, Edmonton, Canada Sep.24, 2024
Workshop title: Automated Mobility in Emerging Mixed Traffic

Workshop Organizer (Second coordinator) | 26th IEEE ITSC 2023, Bilbao, Bizkaia, Spain Sep.24, 2023

Workshop title: Data-driven and Empirical Research for Emerging Mixed Traffic of Automated Vehicles and Human-driven Vehicles

Workshop Organizer (Primary coordinator) | IEEE IV 2023, Anchorage, USA Jun.04, 2023

Workshop title: Development of Socially-compliant Driving Behavior for Automated Vehicles to Enhance Safety and Efficiency in Mixed Traffic

IEEE TCoS Seeding Project Leader (PI) | 2023 IEEE TAB Committee on Standards (TCoS) seed funding

Project title: *Enhancing the deployment of socially-compliant automated vehicles in mixed traffic* (website)

Ad-hoc Journal Reviewer Services

- International Journal of Computer Vision (**IF: 19.5**; Top AI journal)
- Pattern Recognition
- Accident Analysis & Prevention
- IEEE Intelligent Transportation Systems Magazine
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Open Journal of Intelligent Transportation Systems
- Transportation Research Part C: Emerging Technologies
- Transportation Letters: The International Journal of Transportation Research
- Journal of Intelligent Transportation Systems: Technology, Planning, and Operations
- Journal of Transportation Research Record: Journal of the Transportation Research Board
- International Journal of Human-Computer Interaction
- Journal of Advanced Transportation
- IET Intelligent Transport Systems
- Scientific Reports
- Applied Ergonomics
- Discover Artificial Intelligence
- Signal, Image and Video Processing
- European Transport Research Review
- Engineering Applications of Artificial Intelligence
- Archives of Computational Methods in Engineering
- International Journal of Computational Intelligence Systems
- ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering

Ad-hoc Conference Reviewer Services

- IEEE Intelligent Transportation Systems Conference (ITSC) | ***Associate editor***
- IEEE Intelligent Vehicles Symposium (IV) | ***Associate editor***
- Transportation Research Board (TRB) Annual Meeting
- World Congress on Intelligent Control and Automation (WCICA)
- COTA International Conference of Transportation Professionals (CICTP)
- The International Symposium on Transport Network Resilience (INSTR)

THESIS SUPERVISION

Bashar Saadeh | MSc. in Traffic Engineering and Mobility, RWTH Aachen University Nov.2024-Jul.2025

Thesis title: Developing socially compliant automated vehicles in mixed traffic: Insights from questionnaire-based survey

Yuteng Zhang | Master of Science in Transport, Infrastructure & Logistics, TU Delft Jan.2024-Nov.2024

Thesis title: Coordinated Planning and Control for Connected and Automated Vehicles' On-ramp Merging in Mixed Traffic Through Value Decomposition-based Multiagent Deep Reinforcement Learning

Cesar Flores Reyna | MSc. in Sustainable Mobility Transitions, EIT, TU/Eindhoven Jan.2024-Nov.2024

Thesis title: Investigating a Benchmarking Framework for the Large-Scale Micro Simulator (LSMS) Platform in Freeways under Dynamic Speed Limits

Mathijs den Otter | MSc. in Civil Engineering–Transport and Planning, TU Delft Sep.2022-Dec.2023

Thesis title: Impact of Improved Lane Marking Properties on the Performance of Lane Keeping Assistance Systems in Varying Circumstances

Lanxin Zhang | MSc. in Civil Engineering–Transport and Planning, TU Delft Oct.2022-Jun.2023

Thesis title: Semi-supervised Machine Learning for Abnormal Driving Behavior Detection

Henan Yuan | Bachelor in Traffic and Transportation, BJTU & TUDelft TTE Oct.2022-Jun.2023

Thesis title: Deep Reinforcement Learning for Driving through Roundabouts

Shiva Nischal Lingam | MSc. in Civil Engineering–Transport and Planning, TU Delft Jan.2021-Nov.2021

Thesis title: Effects of External Human Machine Interfaces on Automated Vehicles' Communicative Interactions With Human Drivers (Cum Laude) | Won 2nd Cuperusprijs prieze of KIVI

Sandeep Patil | MSc. in Mechanical Engineering (Vehicular Engineering), TU Delft Oct.2020-Aug.2021

Thesis title: Lane Detection using SpatioTemporal Attention

Eline van der Kooij | MSc. in Transport, Infrastructure & Logistics, TU Delft Jul.2020-May.2021

Thesis title: Visibility of Lane Markings for Machine Vision

Sanny Toonen | Bachelor of Science in Civil Engineering-Transport and Planning, TU Delft Jul.2020-May.2021

Thesis title: Lane Recognition for Automated Vehicles

TEACHING ACTIVITIES

Project supervisor, Instructor | EEMCS, TU Delft Nov.2022-Feb.2024

Courses: Advanced Interdisciplinary AI Project (AI2P) (IFEEMCS520201); Capstone Applied AI Project (T13150TU) Fundamentals of Artificial Intelligence Programme (IFEEMCS520100); Computational Intelligence (CSE2530)

Teaching Assistant, Instructor | TU Delft and BJTU joint bachelor program Mar.2022 & Mar.2023

Course: Advanced Lecture "Trends in Transportation" 2022 & 2023

Lecturer | DakeOffer online Platform Mar.2020-Jun.2020 & Nov.2020-Jan.2021

Course: Introduction to Big Data and Artificial Intelligence: Fundamentals and Practice

Teaching Assistant | Transport and Planning, TU Delft Apr.2020-Aug.2020 & Apr.2021-Aug.2021

Course: CIE5805 – Intelligent Vehicles for Safe and Efficient Traffic

Teaching Assistant | Department of Automation, Tsinghua University Sep.2016-Jan.2017

Course: Data Ethics

Teaching and Lab Assistant | Electrical and Electronic Lab Center, Tsinghua University Mar.2015-Jul.2016

Courses: Advanced Labs in Electronic Technology, Fundamentals of Electronics Power Technology

RSI Tutor | Center for Excellence in Education, USA Jul.2017-Aug.2017

Research writing and presentation tutor for the 2017 Research Science Institute Program at Tsinghua University

Undergraduate Counselor (Class 2012) | School of EIE, Beijing Jiaotong University Jul.2012-Jul.2014

TALKS & PRESENTATIONS

Optimization for Shared & Sustainable Mobility | IEEE ITSC 2025, Gold Coast, Australia Nov.19.2025

Presentation topic: A Self-Supervised Transformer for Unusable Shared Bike Detection

Human-Inspired Interactive Autonomous Driving | IEEE ITSC 2024, Edmonton, Canada Sep.26.2024

Presentation topic: Towards Understanding Worldwide Cross-cultural Differences in Implicit Driving Cues

Promoting Diversity and Leadership in ITS | IEEE WiE/YP Workshop & Forum, Cairo, Egypt Nov.21.2023

Presentation topic: Resource Repository: Datasets, Simulation Platforms, and Relevant Publications for Emerging Mixed Traffic of Automated Vehicles and Human-driven Vehicles

Automated Round Transportation | TRB ARTS 2023, San Francisco, USA Jul.12.2023

Presentation topic: Social-aware Planning and Control for Automated Vehicles Based on Driving Risk Field and Model Predictive Contouring Control: Driving through Roundabouts as a Case Study

AI Applications in Transportation Planning | TRB 2023, Washington D.C., USA Jan.11.2023

Presentation topics: (1) Robust Lane Detection through Self Pre-training with Masked Sequential Autoencoders and Fine-tuning with Customized PolyLoss

(2) Sequential Neural Network Model with Spatial-Temporal Attention Mechanism for Robust Lane

Detection Using Multi Continuous Image Frames

Research into Urban Rail Transit Operations and Design | TRB 2023, Washington D.C., USA Jan.11.2023

Presentation topic: Optimization of Coordinated Flow Restriction and Skip-Stopping Schemes for Urban Rail Stations Considering Platform Carrying Capacity

Connected and Automated Vehicles | MFTS 2022, Dresden, Germany Dec.01.2022

Presentation topic: Towards Developing Socially-Compliant Automated Vehicles: State of the Practice, Experts Expectations, and a Conceptual Framework

Automated mobility | IEEE ITSS Young Professionals Fellowship Symposium, Chania, Greece Nov.25.2022

Presentation topic: Multi-goal Proactive Traffic Management for Mixed Traffic of Automated Vehicles (AVs) and Human-Driven Vehicles (HDVs) Using Explainable Physics-Informed Artificial Intelligence

AI, Security, Privacy and Safety Systems in ITS Applications| ITSC2022, Macow, China Oct.08.2022

Presentation topic: Comparative Study on Supervised *vs* Semi-supervised ML for Anomaly Detection of CAN Network

Research on AI and Advancing Computing Applications | TRB 2022, Washington D.C., USA Jan.12.2022

Presentation topic: A Hybrid Spatial-temporal Sequence-to-one Neural Network Model for Lane Detection

Challenges of Automated Vehicles and Traffic | University of Győr, Hungary May.28.2021

Talk topic: Deep Learning for Automated Vehicles' Operational Design Domain: Problems, Challenges, and Case Studies

SAMEN User Committee Annual Meeting | Dutch Research Council (NWO), Delft, Netherlands Jan.28.2021

Talk topic: Data-driven Research for Automated Vehicles' Operational Design Domain: A Case Study on Perception

Intelligence, Connectivity, and Mobility | COTA CICTP 2018, Tsinghua University, China Jul.07.2018

Presentation topic: Revealing Travel Patterns of Sharing Bikes in A Spatial-Temporal Manner Using the NFM Method

World Congress on Intelligent Control and Automation | IEEE WCICA 2016, Guilin, China Jun.12.2016

Presentation topic: Revealing New York Taxi Drivers' Operation Patterns Focusing on the Revenue Aspect

HONORS & AWARDS

- 2025-2026 RWTH Aachen Theodore von Kármán Fellowship for Outgoing Scholars (**7,362 €**)
- Chinese Award for Outstanding Self-financed Students Abroad (**6,000 $**)
- 2025 Entrepreneurs Next Star & Million Prize Global Challenge (German AI+ Deep-Tech) Third Price (**6,000 €**)
- 2025 Outstanding Innovation & Entrepreneurship Award for Chinese Overseas Scholars (Chunhui Program)
- 2025 Seed Track Winner of Changping Digital Economy Science and Technology Innovation Competition (CDIC)
- TU Delft-Transport Institute Interdisciplinary Research Award (**10,500 €**)
- 2023 IEEE TAB Committee on Standards (TCoS) seed funding (**6,000 $**)
- 2024 IEEE ITSS New Initiatives Proposal Funding (**5,000 $**)
- IEEE ITSS Young Professionals Fellowship (Twice)
- Erasmus+ mobility Grants (Twice)
- Outstanding College Graduates of Beijing (**Top 1‰**)
- National Scholarship (**Top 1%**)
- First Class Tsinghua University RONG Scholarship
- Second-Class Merit Scholarship for Master's Students at Tsinghua University
- First-Class Academic Fellowship (**Top 1%**, Twice) and Merit Student (Four times)
- Second Prize in the 2012 & 2013 Undergraduate Electronic Design Contest in Beijing
- Bronze award in the "Challenge Cup" Entrepreneurship Design Contest in Beijing
- First Prize in Freescale Cup University Students Intelligent Car Race (**Rank 2nd**)
- Second Prize in the Physical Experiment Competition in Beijing
- 2019 Microsoft Discover AI Challenge: *Sustainable Life* | Data-Driven All-in-one Shared Mobility | Top (10%)

RESEARCH EXPERIENCE

AI & Automated Mobility Group | Institute of Highway Engineering | **RWTH Aachen University** Jun.2024-Present

- **AIMo-D²RF: AI-**Enhanced Hierarchical **M**ulti-**O**bjects **D**riving **R**isk **F**ield Model --- Integrating Physics-Based and Human Perception-Based Approaches with Drivers' **D**istraction Consideration (PI, *Individual DFG*)
- **Explainable Mathematics-Enhanced AI Model for Multi-Modal Urban Traffic Prediction and Simulation** (Co-PI and coordinator, *DFG Research Unit Proposal*)
- **CycleVLA:** VR-Enhanced Explainable **Vision–Language–Action** Models for Safe, Efficient, and Human-Like **Cycl**ing Navigation in Urban Mixed Traffic (PI and coordinator, *DFG Package Proposal*)
- **Parameter-Efficient Fine-Tuning of Pretrained Multimodal Large Vision Model (LVM) for Privacy-Preserving Traffic Anomaly Detection with Thermal Imaging**
- **Digital Twin for Cycling Interaction in Mixed Traffic: A Multi-Sensor Data Fusion and VR Simulation Approach with CycleScene Benchmark (**PI, *mFUND Proposal***)**

Traffic and Transportation Safety Lab | Department of Transport and Planning | **TU Delft** Dec.2019-Jun.2024

- **Data-driven and AI-based research for expanding Automated Vehicles' Operational Design Domain in mixed traffic (part of SAMEN project)**
  - Developed a hybrid sequence-to-one model for lane detection in extremely difficult driving scenes
  - Incorporated spatial-temporal attention for automated vehicles' perception
  - Designed reliable data-driven algorithms for anomaly and abnormal behavior prediction
  - Implemented Deep Reinforcement Learning (DRL) models for safe, reliable, and socially compliant automated driving under challenging maneuvers involving both longitudinal and lateral control
  - Gaze behavior of road users when interacting with an automated vehicle at an intersection: *Understanding cyclists' perception of driverless vehicles through eye-tracking and interviews*

Mechanical Systems Control (MSC) Lab | Department of Mechanical Engineering | **UC Berkeley** May.2023-Oct.2023

Advisor: Prof. Masayoshi Tomizuka (*Life Fellow of IEEE and ASME; Fellow of the IFAC*)

- **Socially Compliant Automated Driving through DRL and Model-based Social-aware MPC**
  - Reviewed state-of-the-art socially compliant automated driving methods in the literature
  - Developed model-enhanced multi-agent deep reinforcement learning

Waterloo Artificial Intelligence Institute | Faculty of Engineering | **University of Waterloo** May.2018-Sep.2019

- **Applied Machine Learning, Artificial Intelligence, and Big Data Research**
  - Data-driven Anomaly Detection (Unsupervised): Auto-Encoder, Hierarchical Extreme Learning Machines
  - Kaggle Competition: Employ LSTM, LightGBM, and XGBoost to predict stock movements with news data
  - Deep Reinforcement Learning for Car Racing Control in Simulation: DQN, A3C, and PPO

Singapore-MIT Alliance for Research and Technology (SMART) Aug.2016-Sep.2016

Future Urban Mobility (FM) IRG | Project: *SimMobility* | Topic: Taxi Roaming

Advisors: Prof. Moshe BEN-AKIVA (Member of National Academy of Engineering), Dr. Bat-hen NAHMIAS-BIRAN

- **Constructing a model tackling the taxi roaming (taxi service) problem, embedded into *SimMobility* platform**
  - Proposed an advisable solution of cruising along hotspots through a cell-based logit-opportunity model improved by a data-driven method
  - Participated in building the architecture of the final model embedded in *SimMobility*

Intelligent Transportation Laboratory, Tsinghua National Laboratory for Information Science and Technology (TNList) | Advisors: Prof. Zuo Zhang and Prof. Li Li (*IEEE Fellow*) Sep.2014-May.2018

Transportation Research based on machine learning and data-driven methods

- **Revealing New York taxi drivers' operation patterns focusing on revenue**
  - Developed a method for classifying drivers into 3 groups based on their revenue: top, ordinary, low earner

- Excavated the population operation patterns of different taxi driver groups through big data analytics

- **Influence of on-demand ride-sourcing *vs.* traditional taxi based on machine learning and big data analytics**
  - Uncovered the differences between taxi service and ride-sourcing using big data analysis and clustering
  - Applied non-negative matrix factorization (NMF) to obtain basis patterns of Taxi, Hitch, and Express service
- **Fundamental research on intelligent parking guidance and recommendations based on machine learning**
  - Forecast models of travel time to parking lots (*Random Forest*); Guidance & optimization models for parking
  - Personalized recommendation research on parking (Collaborative Filtering and Content-based algorithm)

WORKING EXPERIENCE

Research Group Leader | AI & Automated Mobility Group | **RWTH Aachen University** Jun.2024-Present

- **Research** proposal initialization, preparation, and writing: German Research Foundation (DFG) and mFUND
- **(Co-) PI and coordinator**: main responder and drafter for **three** DFG research proposals
- **Lead** the group and supervise the PhD/MSc students
- **Teaching** support for *Road Planning II* and *Machine Learning in Civil Engineering* (master's level)

PhD Researcher | **TTS Lab** | Department of Transport & Planning | **TU Delft** Dec.2019-Jun.2024

- Carried out PhD research work under the Dutch Research Council (NWO) funded SAMEN project
- Provided teaching assistance and evaluation support for various courses and supervised seven MSc students
- Published scientific papers and patents, presented research works at conferences, and organized workshops

Visiting PhD Researcher | **MSC Lab** | Department of Mechanical Engineering | **UC Berkeley** May.2023-Oct.2023

- Carried out the literature review and research work related to Socially Compliant Automated Driving

Research Assistant | Waterloo Artificial Intelligence Institute | **University of Waterloo** May.2018-Sep.2019

- Carried out research work related to applied Machine Learning, Artificial Intelligence, and Big Data in Transportation

Research Assistant | Transport Data Analyst | **ITS Lab, TNList @ Tsinghua University** Aug.2017-May.2018

- Cross-domain data fusion for full-time trip chain reconstruction and anomaly detection
- City computing: Applying NMF methods to evaluate indicators describing urban function, land use, mobility, etc.
- Revealing collective travel patterns of *Shared Mobility* in a spatial-temporal manner

LEADERSHIP & VOLUNTEER EXPERIENCE

Webmaster | Traffic and Transportation Safety (TTS) Lab Website, TU Delft Mar.2020-Jun.2024

- Responsible for and volunteering for the TTS Lab website development and maintenance

Project Leader | Asian Youth Center: Leadership Development Training Program for Masters Jul.2015-Aug.2016

- Responsible for activities and competitions between overseas and Chinese students in the Asian Youth Center
- ***Volunteer Leader*** in the 5th Joint School Symposium for the Asian Youth Center Project

iTalk Group Leader | International Department, Tsinghua University Postgraduate Association Oct.2014-Oct.2015

- Committed to speech in English given by students or alumni stars, held a special performance for overseas students

Volunteer | National Doctor Forum on Traffic and Transportation Engineering, Beijing Jiaotong University Jun.2011

SKILLS & MISCELLANEOUS

- Programming: Python (PyTorch, TensorFlow, Keras), Matlab, R, C/C++, Java, VHDL | Database: MySQL
- AI Certificates: Deep Learning, Deep Reinforcement Learning, TRAIL Research School Diploma
- Big data analytics and visualization methods | Cross-domain Data Fusion | Data-driven anomaly/fraud detection
- Languages: Chinese (Native); English (Professional); Dutch (Elementary)
- Hobbies: **Tai Chi, Kung Fu**, **Meditation**, Yoga, Reading, Mountain Hiking