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

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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 *Big Data*

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.)*

Key Journal Publications:

1. **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**]

2. **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]**

3. **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 104th TRB Annual Meeting (TRB 2025) for presentation, and **presented** at *the 4th Symposium on Management of Future Motorway and Urban Traffic Systems (MFTS)*), Preprint

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 TRB2024)

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

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. 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

4. 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

5. 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

6. 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)

7. 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)

8. 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)

9. 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

Other Journal and Conference Publications:

1. 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 *[Journal]*

2. Huang, Y.[#], **Dong, Y.[#,*]**, Tang, Y., & Li, L. (2024). Leverage Multi-source Traffic Demand Data Fusion with Transformer Model for Urban Parking Prediction. **Accepted** by *the 28th International Conference of Hong Kong Society For Transportation Studies (HKSTS 2024)* and *the Conference in Emerging Technologies in Transportation Systems (TRC-30)* for presentation, Preprint *[Conference]*

3. **Dong, Y.[#,*]**, Chen, K.[#], & Ma, Z. (2023). Comparative Study on Semi-Supervised Learning Applied for Anomaly Detection in Hydraulic Condition Monitoring System. *2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, Honolulu, Oahu, HI, USA, 2023, pp. 1702-1708, http://dx.doi.org/10.1109/SMC53992.2023.10394193 *[Conference]*

4. 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 *[Journal]*

5. **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 *[Conference]*

6. 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 *[Conference]*

7. **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 *[Conference]*

8. **Dong, Y.**, Ruan, H., Cai, T., Peng, J, and Wang ,W. (2013). Using LED to Demonstrate the Composition of Simple Harmonic Motions and Five Polarization States of Light. *Physics Experimentation*, *11*, 45-48 *[Journal in Chinese]*

Under Review and Working Papers:

1. Patil, S.[#], **Dong, Y.[#,*]**, Farah, H, & Hellendoorn, J. (2025). 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 Vehicles*), Preprint

2. **Dong, Y.**, Saadeh, B., Kemper, D., & García-Hernández, A. (2025). 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. (2025). Benchmarking Emerging and Established Traffic Microsimulation Platforms for Dynamic Speed Limit Applications: A Comparative Study on Dutch Motorways. (Joint first author, corresponding author, abstract **accepted** by the *29th International Conference of Hong Kong Society for Transportation Studies*, *to be submitted* to *Transportation Research Part C: Emerging Technologies*)

4. Ji, J.[#], Lu, R.[#], Belkessa, L., **Dong, Y.**, Wang, L., Madadi, B., Varotto, S., Saunier, N., MacFarlane, G., & Wu, C. (2025). Exploring Artifacts Availability in Transportation Research Using Large Language Models. **Accepted** by the *2025 Transportation Research Symposium (TRS) (presented)*, the *2025 International Symposium on Transportation Data & Modelling (ISTDM)*, and the *2025 Modelling Mobility Conference (MoMo)* for presentation; to be submitted to *Transportation Research Part C*: *Emerging Technologies*.

5. 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

6. 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 Public Transportation*). TRBAM-23-04413 poster, Preprint

7. 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. (Abstract **accepted** by the *29th International Conference of Hong Kong Society for Transportation Studies*, *to be submitted* to *Transportation Research Part C: Emerging Technologies*)

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 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) | 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
- Scientific Reports
- Applied Ergonomics
- Discover Artificial Intelligence
- Signal, Image and Video Processing
- European Transport Research Review
- Engineering Applications of Artificial Intelligence
- 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 Vehicles Symposium (IV) | Associate editor
- IEEE Intelligent Transportation Systems Conference (ITSC)
- 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

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

- ❖ [Chinese CSC 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 €**)
- ❖ 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
- ❖ Merit Student (Four times)
- ❖ First-Class Academic Fellowship (**Top 1%**, Twice)
- ❖ 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

➢ 2018 Railroad Problem Solving Contest: Exploring deep learning to forecast train delays

➢ A Deep Learning Framework for Traffic Forecasting: Exploring GCN joint with LSTM to predict traffic flow

➢ 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 one 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

Influence of on-demand ride-sourcing on vehicle emissions with big data analytics and PHEM model

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)

Study on key technology in Intelligent Vehicle Infrastructure Cooperative Systems (IVICS) (*863* Program)

➢ Contributed to the design report of the basic technical framework and the overall demonstration of IVICS

The Freescale Cup College Students Intelligent Car Race: Intelligent car that can follow   Jun.2012-Jun.2013

specific trajectories based on image processing, pattern recognition, and PID controller

- **Hardware Aspect:** Designed the signal acquisition circuit and the core control circuit based on MC9S12XS256
- **Software Aspect:** Developed specific control strategies/algorithms for intelligent cars to follow given trajectories
- **Actuator:** Customized specific steering linkage, applied and tuned PID algorithms to control diversion and speed

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

Data Analyst & Project Manager | Beijing Gooagoo Technical Service Co., Ltd.   Jul.2016-Aug.2016

- Integral process of Big Data Analytics: Crawled carryout service data using Python crawler; executed data storage, data analysis, and data processing in a relational database (MySQL); visualization, clustering, and web application

Commentator | China International Congress on Intelligent & Connected Vehicles (CICV) Oct.2015-Oct.2015

- Introduced the i-VICS systems to audiences; received executives from automobile manufacturers BMW, Volvo, VW

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 (TensorFlow, PyTorch, Keras), Matlab, R, C/C++, Java, VHDL | Database: MySQL
- AI Certificates: Deep Learning, Deep Reinforcement Learning, TRAIL Research School Diploma
- Hardware circuit design: Altium Designer | Software development on Linux and Windows
- 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, Chess, Reading, Mountain Hiking