

# DR. YI YU (EVE)

Current Position: Young Researcher | Shanghai Artificial Intelligence Laboratory

**Research Interests:** Intelligent Transportation Systems, Traffic State Evaluation  
AI Safety, Data Economy, Smart Cities, Agent-Based Modeling

Email: eveyu@zju.edu.cn · Tel/WeChat: +8615867172227 · Personal Homepage: eveyuyi.github.io

## EDUCATION

2017-2022	<b>Zhejiang University</b>	Transportation Engineering	Ph.D.	Work with Prof. Dianhai Wang
2020-2022	<b>Imperial College London</b>	Visiting Scholar		with Prof. Washington Ochieng, FREng
2013-2017	<b>Zhejiang University</b>	Civil Engineering	Bachelor of Science	GPA 3.72/4.0
2013-2017	<b>Zhejiang University</b>	Law	Minor	GPA 3.78/4.0
2019 2018 2014	<b>University of Tokyo, University of Toronto, York University</b>			Exchange Student

## WORK AND INTERNSHIP EXPERIENCE

2022.07-Present	<b>Shanghai AI Lab</b>	Urban Computing Center	<b>Young Researcher</b>
<ul style="list-style-type: none"><li>Conduct research on secure data sharing and pricing in smart cities. Lead a multidisciplinary team in developing an LLM-based traffic data trading platform.</li><li>Investigate trustworthy AI by designing and implementing a multi-agent simulation platform to evaluate the safety and trustworthiness of Large Language Models (LLMs).</li><li>Explore societal impacts of LLMs, particularly within the domain of Intelligent Transportation Systems.</li></ul>			
2020.06-2020.10	<b>Didi Chuxing Tech Co.</b>	Safety Product Department	<b>Algorithm Intern</b>
<ul style="list-style-type: none"><li>Created anomaly detection and risk assessment models via machine learning algorithms in ride-sharing systems</li><li>Mine cheating scenarios in ride-sharing orders, develop anti-cheating algorithms, promote business security, apply for four national patents</li></ul>			

## SELECTED PUBLICATIONS AND PRESENTATIONS

### Journal Articles

- Jiaqi Zeng, **Yi Yu**, Yong Chen, Di Yang, Lei Zhang, and Dianhai Wang. Trajectory-as-a-Sequence: A novel travel mode identification framework. *Transportation Research Part C: Emerging Technologies*, January 2023.
- Yi Yu**, Yanlei Cui, Jiaqi Zeng, Chunguang He, and Dianhai Wang. Identifying traffic clusters in urban networks based on graph theory using license plate recognition data. *Physica A: Statistical Mechanics and its Applications*, 2022.
- HongSheng Qi, **Yi Yu**, Qing Tang, and XianBiao Hu. Intersection traffic deadlock formation and its probability: A petri net-based modeling approach. *IET Intelligent Transport Systems*, 2022.
- Yanlei Cui, **Yi Yu**, Zhengyi Cai, and Dianhai Wang. Optimizing Road Network Density Considering Automobile Traffic Efficiency: Theoretical Approach. *Journal of Urban Planning and Development*, 148, 2022.
- Yi Yu**. Urban Traffic State Evaluation Methods Based on Automatic Number Plate Recognition Data. Ph.D Thesis. Zhejiang University. 2022.
- Yi Yu**, Jiaqi Zeng, and Dianhai Wang. Free-flow travel time estimation in urban roads based on a data resampling method, *Journal of Zhejiang University(Engineering Edition)*, 2022.
- Jiaqi Zeng, Dianhai Wang, Guozheng Zhang, **Yi Yu**, and Zhengyi Cai. Passenger-to-Car Assignment Optimization Model for High-Speed Railway with Risk of COVID-19 Transmission Consideration. *Mathematical Problems in Engineering*, December 2021.
- Yi Yu**, Mengwei Chen, Hongsheng Qi, and Dianhai Wang. Copula-Based Travel Time Distribution Estimation Considering Channelization Section Spillover. *IEEE Access*, 2020.
- Chunguang He, Dianhai Wang, **Yi Yu**, and Zhengyi Cai. A Hybrid Deep Learning Model for Link Dynamic Vehicle Count Forecasting with Bayesian Optimization. *Journal of Advanced Transportation*, 2023.
- Miao Qing-Hai, Wang Xing-Xia, Yang Jing, Zhao Yong, Wang Yu-Tong, Chen Yuan-Yuan, Tian Yong-Lin, **Yu Yi**, Lin Yi-Lun, Yan Ran, Ma Jia-Qi, Na Xiao-Xiang, Wang Fei-Yue. From foundation intelligence to

general intelligence: The state-of-art and perspectives of GenAI and AGI based on foundation models. *Acta Automatica Sinica*, 2024.

### *Conference Proceedings*

1. **Yi Yu**, Shengyue Yao, Juanjuan Li, Fei-Yue Wang, and Yilun Lin. SWDPM: A Social Welfare-Optimized Data Pricing Mechanism. In 2023 IEEE international conference on systems, man, and cybernetics (SMC), October 2023, IEEE, Hawaii, USA.
2. **Yi Yu**, Shengyue Yao, Kexin Wang, Yan Chen, Fei-Yue Wang, and Yilun Lin. Pursuing Equilibrium of Medical Resources via Data Empowerment in Parallel Healthcare System. In 2023 IEEE international conference on systems, man, and cybernetics (SMC), October 2023, IEEE, Hawaii, USA.
3. Xinyi Lv, **Yi Yu**, Xinzhaio Xie, Fei-Yue Wang, Yilun Lin, and Yan Chen. Optimize the accessibility of health-care facilities via ACP-based approach. In 2023 IEEE international conference on systems, man, and cybernetics (SMC), October 2023, IEEE, Hawaii, USA.
4. Jingru Yu, **Yi Yu**, Shengyue Yao, Ding Wang, Pinlong Cai, Honghai Li, Li Li, Fei-Yue Wang, and Yilun Lin. RoW-based Parallel Control for Mixed Traffic Scenario: A Case Study on Lane-Changing. In 2023 IEEE international conference on Intelligent Transportation System(ITSC), October 2023, IEEE, Spain.
5. Jia Xu, Shengyue Yao, **Yi Yu**, Fei-Yue Wang, and Yilun Lin. DeMaaS: Efficient Service Distribution for MaaS via Decentralized Collaboration and Optimization. In 2023 IEEE international conference on Intelligent Transportation System(ITSC), October 2023, IEEE, Spain.
6. Shengyue Yao, Jingru Yu, **Yi Yu**, Jia Xu, Xingyuan Dai, Honghai Li, Fei-Yue Wang, and Yilun Lin. Towards Integrated Traffic Control with Operating Decentralized Autonomous Organization. In 2023 IEEE international conference on Intelligent Transportation System(ITSC), October 2023, IEEE, Spain.

### *Presentations and Conferences*

- **Oral presentation:** “Data on the Move: Transportation-Oriented Data Trading Platform Powered by AI Agent with Common Sense.” at 2024 IEEE Intelligent Vehicles Symposium, June 2024, Jeju Island, South Korea
- **Oral presentation:**  
SWDPM: A Social Welfare-Optimized Data Pricing Mechanism at 2023 IEEE International Conference on Systems, Man, and Cybernetics, October 2023, Hawaii, USA.
- **Invited talk:** “Urban Traffic State Monitoring Based on Automatic Number Plate Recognition Data” at 2022 China-UK Technology Summit, December 2022, London, UK.

## RESEARCH PROJECTS

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### **Automatic AI Safety Evaluation System Research** (National Key R&D Program of China)

- Role: Main participator, Grant No. 2022ZD0160104, Duration: 2022-2024
- Develop frameworks for evaluating and ensuring the safety of AI systems in critical infrastructure
- Apply machine learning techniques to identify potential risks and vulnerabilities in AI deployments

### **Data Economy Research in Smart City** (National Key R&D Program of China)

- Role: PI, Grant No. 2022ZD0160104, Duration: 2022-2024
- Lead a multidisciplinary team in developing an LLM-based traffic data trading platform, which serves as a test field for data trading in the data economy.
- Propose data pricing models that maximize social welfare via deep learning. Introduce agent-based data pricing models via LLM techniques. Devise incentive mechanisms via federated learning.

### **City Brain-ITS: Developing Intelligent Transportation System for Hangzhou** (Local Cooperation Project)

- Role: PI, Duration: 2018-2022, Grant amount: CNY 4,500,000
- Implemented advanced traffic state and safety status models using AI and big data analytics
- Developed risk assessment methodologies for urban transportation networks

### **Urban traffic intrinsic acquisition and demand structure optimization control based on big data** (National Natural Science Foundation of China)

- Role: Main participator, Duration: 2022-2026, Grant No. 52131202, Grant amount: CNY 3,090,500
- Leveraged big data analytics to uncover intrinsic characteristics of urban traffic patterns
- Developed AI-driven optimization models for traffic demand management and resource allocation

### **Multi-source Heterogeneous Big Data for Urban Traffic** (National Natural Science Foundation of China)

- Role: Main participator, Duration: 2021-2024, Grant No. 52072340, Amount: CNY 648,000
- Integrated diverse data sources to enhance understanding of urban traffic patterns

- Developed novel machine learning algorithms for processing heterogeneous transportation data

**Urban Traffic Structure Control Based on System Dynamics** (National Natural Science Foundation of China)

- Role: Main participator, Duration: 2018-2021, Grant No. 61773338, Amount: CNY 640,000
- Applied system dynamics modeling to urban traffic control
- Developed optimization algorithms for resource allocation in transportation networks

**Mechanism of Piezoelectric Energy in High-Speed Wind Environments** (Undergraduate Research Program)

- Role: Main participator, Duration: 2015-2017
- Explored innovative energy harvesting techniques for transportation infrastructure
- Developed models to predict energy generation under various environmental conditions

## ACADEMIC SERVICES AND TEACHING

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**Journal Reviewer:** IEEE Transaction of Intelligent Vehicle (TIV), IEEE Transaction of Systems, Man, and Cybernetics (TSMC), Applied Sciences, Future Transportation, Sustainability

**Conference Reviewer:** Transportation Research Board (TRB) Annual Meeting, IEEE Intelligent Transportation Systems Conference (ITSC), IEEE International Conference on Systems, Man, and Cybernetics (SMC)

**Research Mentor** for interns at Shanghai AI Lab (2023-2024)

- Guide five graduate students in research projects focusing on AI safety, Data trading, and Intelligent Systems
- Assist students in developing comprehensive research skills, including literature review, data processing, advanced modeling techniques, and academic writing
- Fostered interdisciplinary thinking by connecting AI with traffic systems, healthcare systems, and economics.

**Graduate Teaching Assistant** for “Traffic Engineering” at Imperial College London (2021-2022)

- Assisted in developing course materials that integrated AI with traditional traffic engineering
- Provided one-on-one tutoring, helping students bridge the gap between theoretical concepts and practical applications in traffic engineering
- Lead weekly discussions, emphasizing the application of AI in solving transportation problems

**Math and Physics Teacher** in College Student Volunteer Teaching Program at Meilin City, Anhui Province (2014)

**Member of Institution of Civil Engineering in the UK**

## SKILLS AND AWARDS

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**Programming:** Python, SQL, MATLAB    **AI and Data Science:** Transformer, TensorFlow, PyTorch, scikit-learn

**Modeling:** Traffic flow modeling, Agent-based modeling, AI-based prediction, Data-driven optimization

**Software:** SUMO, VISSIM, TransCAD, AutoCAD, ArcGIS, Photoshop, LaTeX

**Languages:** Mandarin native proficiency    English full professional proficiency (TOEFL 103)

**Honors and Awards:**

- 2nd prize in National Civil Engineering Undergraduate Innovation Contest
- Excellent (Postgraduate) Student Award (\*2) at Zhejiang University
- 3rd prize in 11th 'Challenge Cup' College Student Entrepreneur Competition at Zhejiang University
- Outstanding Volunteer Student at Zhejiang University
- Outstanding Student Leader Rewards at Zhejiang University