Yuan-Zheng Lei

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Born: March 25, 1997— Hunan, China
Nationality: China

Research Interest

Transportation; Game theory; Optimization; Applied statistics.

Research Experience

2019-2022 **National United Engineering Laboratory of Integrated and Intelligent Transportation, Chengdu, Sichuan, China** Project: Regional Rail Transit Collaborative Transportation and Service System

2019-2022 **National United Engineering Laboratory of Integrated and Intelligent Transportation, Chengdu, Sichuan, China** Project: A Hybrid Simulation System of Multi-modal Rail Transit Trains Operation of the Chengdu-Chongqing Economic Circle

2023- **Maryland Transportation Research & Artificial Intelligence Laboratory, College Park, MD, USA** Project: NSF CAREER: Physics Regularized Machine Learning Theory: Modeling Stochastic Traffic Flow Patterns for Smart Mobility Systems (# 2234289)

Education

2015-2019 BSc in Railway Engineering, Southwest Jiaotong University, Chengdu

2019-2022 MSc in Transportation Planning and Management, Southwest Jiaotong University, Chengdu

2022-present PhD student in Transportation Engineering, University of Maryland, College Park

Publications and Technical reports

Working papers

2025 **Yuan-Zheng Lei**, Yaobang Gong, Dianwei Chen, and Xianfeng Terry Yang, "Potential failures of physics-informed machine learning in traffic flow modeling: theoretical and experimental analysis"**to be submitted to Transportation Research Part B: Methodological**

2025 **Yuan-Zheng Lei**, Yaobang Gong, and Xianfeng Terry Yang, "A modified two-stage search framework for constrained multi-gradient descent"**to be submitted to European Journal of Operational research**

Journal articles

2024 **Yuan-Zheng Lei**, Yao Cheng, and Xianfeng Terry Yang, "An optimization-free approximation Framework for Connected and Automated Vehicles Eco-Trajectory Planning Under limited computing capacity," **Transportation Research Part C: Emerging Technologies**

2024 **Yuan-Zheng Lei**, Yaobang Gong, and Xianfeng Terry Yang, "Unraveling Stochastic Fundamental Diagrams with Empirical Knowledge: Modeling, Limitations, and Future Directions," **Transportation Research Part C: Emerging Technologies**

2022 **Yuan-Zheng Lei**, Gongyuan Lu, Hongxiang Zhang, Bisheng He and Jinxin Fang, "Optimizing total passenger waiting time in an urban rail network: A passenger flow guidance strategy based on a multi-agent simulation approach," **Simulation Modelling Practice and Theory**

2022 Hongxiang Zhang, Gongyuan Lu, **Yuan-Zheng Lei**, Guangyuan Zhang and Irene Niyitanga, "A hybrid framework for synchronized passenger and train traffic simulation in an urban rail transit network," **International Journal of Rail Transportation**

2022 Gongyuan Lu, **Yuan-Zheng Lei** and Hongxiang Zhang, "Passenger flow control strategy of urban rail transit based on Multi-Agent Simulation," **Journal of Tongji University(Natural Science)**

Last updated: April 6, 2025