

Chen Shi

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EDUCATION

Dalian University of Technology | Transportation Planning and Management (Master's, 83.6) SEP 2024-2027

Courses : Intelligent Transportation Systems, Traffic Control Theory and Method, Integration of Land Use and Transportation Planning, Deep Learning and Algorithm Design, Stochastic Process.

Dalian University of Technology | Transportation Engineering (Bachelor's, 85.9) SEP 2020 - JUN 2024

Courses: Transportation Planning, Traffic Management and Control, Traffic Flow Theory and Simulation Technology, Operations Research, C++, Python, Data Structures and Algorithms.

RESEARCH EXPERIENCE

Research on Multi-level Cooperative Control Strategies for Vehicle-Road Collaboration

Mar. 2024 - present

- ✓ **Model Development:** Built a three-level "Signal-Route-Speed" optimization model with coupling through saturation and delay. Applied MPC and TuRBO for signal timing optimization, K-shortest path and MSA for route assignment.
- ✓ **Algorithm Design:** Proposed PIA-TuRBO algorithm integrating traffic engineering knowledge (Webster delay model) into Bayesian optimization with cooperative prior functions and adaptive trust region strategies.
- ✓ **Coupling Mechanism:** Established coupling chain: route flow → intersection flow → saturation → delay, achieving bidirectional influence through incidence matrix.
- ✓ **Simulation Validation:** Implemented on SUMO using Qingdao network (31 intersections). Preliminary results show 42.9%-67.6% reduction in total travel time (penetration rate 30%-80%).

Intelligent Transportation Experimental Platform | Python, FastAPI, PostgreSQL, JavaScript

Jun. 2025 - Present

- ✓ Developing *vehicle-road-cloud integrated platform* with multi-source data collection, traffic flow reconstruction/prediction, control strategy optimization and experiment management modules.
- ✓ Building *full-stack* application using Python FastAPI backend, PostgreSQL database with SQLAlchemy ORM, and JavaScript frontend with ECharts visualization.
- ✓ Implementing *virtual-physical simulation environment* for traffic scenario testing and performance evaluation.

Research on Regional Integrated Traffic Control Technology in the Intelligent Connected Environment

Feb. 2023 - Mar. 2024

- ✓ Constructed multi-layered traffic signal models coordinated with connected vehicles.
- ✓ Optimized a simulation platform for managing hybrid traffic flows.

OTHER EXPERIENCE

- ❖ **Outcomes:** Conference paper for ITSAC 2025, Invention Patents of China *2
- ❖ **Awards:** DUT Outstanding Bachelor's Thesis Award (2024)
- ❖ **Conference Presentations:** ISMT 2024
- ❖ **Academic Visits:** Japan (Oct 2023), Singapore (Jun 2024)
- ❖ **Academic Training:** THU-TUM Winter School on Transportation (Nov 2024), GREAS 2025 for NCSU

SKILLS

- ❖ **Techniques:** Traffic Control and Modeling, Python Programming, Simulation Validation, System Modeling, Full-Stack Development
- ❖ **Soft Skills:** Academic Communication, Academic Poster Presentation, Online Research, Teamwork