CHANGXIN WAN

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SUMMARY: Traffic engineering student, with a specific interest in trajectory planning, eco-driving, and intelligent transportation systems. Experienced with several academic projects and conferences. Seeking for opportunity to start academic researches related to ego vehicle/ traffic flow control with uncertain conditions (e.g., unknown dynamics, stochastic movement of human drivers).

EDUCATION

Hohai University, Nanjing, China **Sep. 2022-Present**

Master of Engineering in Transportation, Transportation Management and control, GPA: 4.72/5.0 (Ranked 4/59)

Thesis Topic: Spatio-termporal cooperative control for connected and automated vehicles in mixed traffic: A bus priority approach

Hohai University, Nanjing, China **Sep. 2018-June. 2022**

Bachelor of Engineering in Traffic, GPA: 91.76/100 (Ranked 2/25)

Thesis Topic: Eco-driving of connected and automated vehicles and dynamic bus lane control strategy (Outstanding paper award)

EXPERIENCE

ACADEMIC PROJECTS/FOUNDATIONS

- **Natural Science Foundation of Jiangsu Province (BK20242054),** entitled '*Mechanism of high occupancy vehicle lane management and signal collaborative control method for intelligent connected bus*'. (Team member, 07/2024 06/2027). **Worked on** the Graph Neural Network (GNN) modeling for intersection-based mixed traffic flow state representation, reinforcement learning (RL)-based strategy signal collaborative control.
- **National Natural Science Foundation of China (52002113),** entitled '*Energy saving operation control mechanism and trajectory planning of electric bus under cooperative vehicle infrastructure system*'. (Team member, 01/2021 12/2023). **Worked on** the eco-friendly trajectory planning method for connected and automated buses, safety enhanced speed guidance for connected and automated cars under mixed traffic flow.
- **Natural Science Foundation of Jiangsu Province (BK20200526),** entitled '*A spatio-termporal collaborate control method for dynamic bus lane under cooperative vehicle infrastructure system*'. (Team number, 07/2020-06/2023). **Worked on** the optimization of spatio-termporal trajectories under dynamic bus lane condition, and analysis the availability of dynamic bus lane with different traffic conditions.
- **Key Laboratory of Road and Traffic Engineering of the Ministry of Education, Tongji University (K202302)**, entitled '*Modeling and simulation of corridor signal coordination control strategy under mixed traffic environment*'. (Team number, 09/2023-08/2025). **Worked on** the uncoupling of corridor signal offset optimization and vehicular trajectory planning, and the multi-objective optimization model for the mixed traffic flow.

CONFERENCE PRESENTATIONS

- The 4th IEEE Forum for Innovative Sustainable Transportation Systems (FISTS 2024), Developing a novel eco-driving strategy for connected and automated vehicle at isolated signalized intersection, Riverside, CA, U.S., Feb. 2024, poster presentation.
- The 14th Workshop on Computational Transportation Science (CTS 2023), Multi-objective coordinated control strategy for mixed traffic with partially connected and automated vehicles in urban corridors, Shanghai, China, Aug. 2023, oral presentation.
- The 13th Workshop on Computational Transportation Science (CTS 2022), High occupancy vehicle lane strategy considering bus priority in intelligent and connected vehicle environment, Xi'an, China, Aug. 2022, oral presentation.

RELEVANT PUBLICATIONS

PUBLISHED JOURNAL ARTICLES

- **Wan, C.**, Shan, X., Hao, P., & Wu, G. (2024). Multi-objective coordinated control strategy for mixed traffic with partially connected and automated vehicles in urban corridors. ***Physica A: Statistical Mechanics and its Applications***, 635, 129485.
- Shan, X. (Advisor), **Wan, C.**, Hao, P., Wu, G., & Barth, M. J. (2024). Developing a novel dynamic bus lane control strategy with eco-driving under partially connected vehicle environment. ***IEEE Transactions on Intelligent Transportation Systems***, 25(6), 5919-5934.
- Shan, X. (Advisor), **Wan, C.**, Hao, P., Wu, G., & Zhang, X. (2023). Connected eco-driving for electric buses along signalized arterials with bus stops. ***IET Intelligent Transport Systems***, 17(3), 579-591.
- Shan, X. (Advisor), **Wan, C.**, Li, Z., Zhang, X., & Cao, C. (2022). Modeling and simulation of multi-lane heterogeneous traffic flow in intelligent and connected vehicle environment. ***Journal of Transportation Systems Engineering and Information Technology***, 22(6), 74-84. (Chinese Journal)

UNDER REVIEW JOURNAL PAPER

- Shan, X. (Advisor), **Wan, C.**, Hao, P., Wu, G., & Barth, M. J. Eco-driving strategy for connected and automated vehicle platoons under mixed traffic environment in urban corridors: An event-triggered based approach. Submitted to ***IEEE Transactions on Intelligent Transportation Systems***, Awaiting AE assignment.
- **Wan, C.**, & Shan, X. Multi-agent reinforcement learning for cooperative eco-driving under mixed traffic environment: A graph embedding-based approach. To be submitted to ***Transportation Research Part C: Emerging Technologies***, Writing in process.

CONFERENCE PAPER

- **Wan, C.**, Shan, X., & Guan, H. (2024). Developing a novel eco-driving strategy for connected and automated vehicle at isolated signalized intersection. ***The 4th IEEE Forum for Innovative Sustainable Transportation Systems (FISTS 2024)***, 1-6.

PATENTS

- Shan, X. (Advisor), & **Wan, C**. Dynamic bus lane energy-saving optimization control method under vehicle-road cooperative environment. CN patent CN115497315B, Granted Oct. 2023.
- Shan, X. (Advisor), & **Wan, C**. Ecological driving method for intelligent network-connected automobile passing through intersection without stopping. CN patent CN115497314B, Granted Oct. 2023.
- **Wan, C.**, Wang, X., Li, Y., Ren, J., & Wang, Y. A simulation method for a single lane cellular automaton model with continuous acceleration constraint. CN patent CN113313939A, Granted Jun. 2023

HONORS AND AWARDS

- China National Scholarship (Top 0.4%), Nov. 2024.
- Best paper runner-up award of IEEE-FISTS 2024, Feb. 2024.
- Outstanding award (First prize) of undergraduate and junior college graduation thesis (design) of Jiangsu province, July. 2023.
- Outstanding award (Ranked 37/ 1134) of the 10th China Post-Graduate Mathematical Contest in Modeling, Jan. 2023
- Outstanding winner and SIAM award (Top 0.12 %) of Mathematical Contest in Modeling (MCM), Mar. 2022.

SKILLS

- **Programming Language:** Matlab, Python.
- **Software:** AutoCAD, Vissim, Sumo.
- Have experience to code eco-driving strategies (e.g., trigonometric function based method, polynomial function based method , non-linear programming optimization based method, Pontryagin Minimum Principle based method) with mixed traffic environment in Matlab and Python by myself.
- Have experience to code graph neural network (graph convolutional neural network, graph attention neural network), deep reinforcement learning algorithm (DQN, TD3, SAC, etc), and combining them into cooperative eco-driving strategy under mixed traffic environment in Sumo simulation.