Zhengyang Wan

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EDUCATION

M.E. in Transportation Engineering, Tongji University, China *Sept.2022 - Jun.2025 (Expected)*

- GPA: 4.5/5.0

- Recommended for admission to graduate studies without entrance exam.

- Core Modules: Model Predictive Control, Numerical Analysis, Transport Data Analysis & Application, Autonomous driving and smart mobility, etc.

B.E. in Vehicle Engineering, Tongji University, China *Sept.2018 - Jun.2022*

- GPA: 4.23/5.0

- Core Modules: Advanced Mathematics, C/C++ Programming, Vehicle Dynamics, Data Science (Python), etc.

RESEARCH INTERESTS

Autonomous Driving Control, Human-vehicle interaction and cooperation, Real-time Driving Simulation.

PUBLICATIONS

[J1] **Wan ZY**, Zhou HC, Zhang JM. "Development of Driving Simulation Platform for Virtual Track Train." *Urban Rapid Rail Transit*, 2024. (Accepted, In Press)

[J2] Zhou HC, **Wan ZY**, Mei MS, et al. "Study of The Tire Wear of Virtual Track Train." *Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering*, 2024. (Published online)

PATENTS

[P1] "An Integrated Driving Simulation Platform for Virtual Track Trains" (**Co-inventor**). Patent Publication Number CN118605217A, filed May 2024. (Pending)

RESEARCH EXPERIENCE

Study on Curving Passing Performance of Virtual Track Train (VTT) Based on Integrated Driving Simulation Platform *Sept.2023 – Jun.2025(Expected)*

(Master's thesis. Advisor: Associate Prof. Hechao Zhou, Tongji University)

- Led the development of a driving simulation platform to study VTT's tracking and dynamics performance.

- Implemented model predictive control algorithms, significantly improving VTT's control effort when passing through curves. Integrated SIMPACK-RealTime in Ubuntu to develop a human-in-the-loop test rig to simulate driver's behaviour, realizing the simulation in different driving modes.

- Developed visualization interface using UnrealEngine, simulating VTT's operation in different scenarios.

- Research outcomes provided new insights into VTT control and trajectory optimization, leading to a peer-reviewed journal publication [J1] and a patent [P1].

Virtual Track Train Tire Wear Evolution Law and Wear Control Strategy *Jun.2022 - Oct.2023*

(State Key Laboratory Open Funding Project)

- Developed and validated a finite element tire model using ABAQUS, performing quantitative simulations of tire wear based on Steady State Transport methods.

- Provided key insights into the heightened wear rates of VTT tires compared to other rubber-tired vehicles, offering a theoretical basis for VTT maintenance strategies. Published related findings in a peer-reviewed journal [J2].

Air-Rail Transportation Technologies for the Eastern Hub *Dec.2023 - now*

(Shanghai Scientific Research Program)

- Contributed to the development of design standards for air-rail transport vehicles at the Eastern Hub, optimizing vehicle design and transportation procedures.

- Conducted field research and literature reviews; Proposed design recommendations and developed a dynamics model for the new air-rail transport vehicle.

- This project significantly supports the development of air-rail transport system in Shanghai, enhancing freight efficiency by 30%.

Development of Portable Commissioning Equipment for CR200J *Feb.2023 - Apr.2024*

(School-Enterprise Co-operation Project with China Railway Shanghai Group Co., Ltd.)

- Designed the architecture of an intelligent commissioning equipment for CR200J, incorporated LoRa technology to improve remote communication in strong-interference environments.

- Conducted on-site testing and data analysis, contributing to the successful deployment of the equipment by China Railway. Reduced the commissioning time by 10%.

SKILLS AND SELF-EVALUATION

- **Academic Expertise**: Extensive research experience in vehicle dynamics, autonomous vehicle prediction, and control, with a strong capability to contribute to interdisciplinary projects.
- **Languages**: Fluent in English (IELTS 7.5, GRE 328) and Mandarin (native proficiency).
- **Technical Skills**: Proficient in MATLAB, SIMPACK, Python, with experience in Ubuntu, CAD, ABAQUS, C++, Origin, and Zotero.
- **Research & Self-Management**: Strong ability to conduct independent research, with excellent time management and task prioritization skills.
- **Leadership & Teamwork**: Proven leadership as Chairman of Tongji University Football Association and Captain of the college's football team, fostering collaboration, communication skills and teamwork.

RELEVANT EXPERIENCE

Tongji University & Technische Universität Berlin Academic Exchange Programme *Jul.2024*

(Academic Workshop. Berlin, Germany)

- Presented at the academic workshop on "Trajectory Control Algorithm and Dynamic Performance of Virtual Track Train."

Cargill Investment (China) Co., Ltd. Shanghai, China. *Oct.2021 - Mar.2022*

Data Analyst Intern

- Developed a Python program to automate the extraction of daily trading data and calculated implied volatility using BAW and Black-Scholes option pricing models. Reduced acquisition time from 24 hours to less than 1 hour.

SCHOLARSHIPS AND AWARDS

Outstanding Student Scholarship, Institute of Rail Transit, Tongji University

- Awarded for ranking in the top 10% of the class. (Total award: 300 USD / 2,000 CNY)

First Prize in HARTING Science and Technology Competition, HARTING Technology Group

- Ranked 1st out of 30 participants for the best project. (Total award: 1,400 USD / 10,000 CNY)