Tian Qin

Email: qintian0142@163.com | Tel: +86- 17761300142
Address: No. 11 Ding, Xueyuan Rd., Haidian Dist., Beijing, China 100083

EDUCATION

China University of Mining and Technology Beijing(211)　　　　　　　　　*Sep 2023 – Present*
M.Sc. in Control Science and Engineering
Supervisor: Prof. Kehu-Yang, Lab of Intelligent Energy System and Autonomous Mining
GPA: 3.40/4.0 | State Stipend for TWO Years
Core Courses: *Linear system theory*, *adaptive control theory*, *Kalman Filtering*

Sichuan University(985)　　　　　　　　　　　　　　　　　　　　　　　*Sep 2015 – Jun 2019*
B.Eng. in Electronic and Information Engineering
GPA: 2.93/4.0 | The Second-class Academic Scholarship
Core Courses: *Signals and systems, Circuit theory*, *automatic control theory*

PUBLICATIONS

In submit

Qin Tian, Zhu Desheng, Wang Chunhui, et al. *Dual-Loop Fuzzy-PID Acceleration Tracking Controller for Autonomous Mining Trucks under Variable Payload Conditions*[J]. Coal Engineering. [Decision in Process]
- Targeting large-scale dynamic payload variations in mining trucks, developed a dual-loop fuzzy PID control architecture with parameter self-adaptive compensation.
- Outcome: Achieved a maximum speed error of 0.49 km/h (1.6% of the running speed) and maximum acceleration error of 0.103 m/s².
- Comparison: Compared with MPC, the peak-to-peak speed error reduced by 8.77%, and the acceleration error reduced by 13.30%.

Conference

- **Qin T**, Qiu L, Chen J, et al. *Double-Layer Following Controller for Autonomous Vehicles*. 2024 36th Chinese Control and Decision Conference (CCDC).IEEE 2024:908-913.

A dual-layer controller integrating DWA and fuzzy-adaptive PID was proposed for autonomous vehicles. This method resulted in a 19.5% reduction in the root mean square of lateral acceleration compared to the PID-Stanley algorithm, enhancing comfort while ensuring safety.

- Wang C, Zhu D, **Qin T**, et al. *Lateral Trajectory Tracking of Autonomous Mining Trucks Using MPC with Adaptive Load Compensation*. Chinese Control and Conference (CCC), IEEE 2025.

The proposed model predictive control (MPC) algorithm with adaptive load compensation showed a 33.33% decrease in mean lateral error compared to the LQR algorithm under varying payload conditions, improving the system's robustness and accuracy in dynamic environments.

- Yang P, Zhu D, **Qin T**, et al. *Adaptive Heading Tracking Algorithm Based on Vehicle Dynamics Model*. Chinese Control and Conference (CCC), IEEE 2025.

The adaptive heading tracking algorithm demonstrated a 47% reduction in lateral error compared to traditional pure tracking algorithms, significantly enhancing control precision and stability in the autonomous navigation of mining trucks.

PROJECTS

Key Technologies and Application Demonstration of Robotized Autonomous Transportation and Loading/Unloading System for Large Open-pit Mines　　　　　　　　　　　　　　　　　　　　　*2022 – 2025*
Chinese Key National Research and Development Project
- Developed and tested an MPC controller for autonomous mining trucks.
- Tools: ROS, C++, Python.
- Controller Performance: Lateral parking error < 0.4m, longitudinal error < 0.15m.

COMPETITIONS

China Intelligent Connected Vehicle Challenge　　　　　　　　　　　　　　　　　*Top 5%*
Contribution Award
- Developed an adaptive cruise controller within the Virtual Test Drive (VTD) simulation platform to optimize trajectory and maintain safe following distances using DWA and Fuzzy-PID hybrid control.
- Achievements: Maintained lateral acceleration RMS < 0.1 m/s² and longitudinal acceleration RMS < 0.06 m/s².

Autopilot Challenge of the Vehicle-Road-Cloud Integration　　　　　　　　　　　　*Top 5%*
Innovation Award
- Deployed system integration of an LQR controller onto the autonomous vehicle platform.
- Achievements: Achieved 7th place out of 118 teams by deploying algorithms on real-world vehicles for tasks like parking, obstacle avoidance, lane-changing, and U-turns.

National Post-Graduate Mathematical Contest in Modeling　　　　　　　　　　　　*Top 20%*
Participation Award
- Constructed a multi-physics field coupling model for magnetic components and optimized parameters using particle swarm optimization.
- Outcome: Improved model accuracy by 5%.

PROFESSIONAL EXPERIENCE

Hardware Engineer, CASIC　　　　　　　　　　　　　　　　　　　　　　*Jul 2019 – Aug 2023*
Wuhan, Hubei
- Contributed to the unmanned mining truck transformation project.
- Designed the PLC controller and developed the control redundancy system.
- Ensured the safe operation of 165 unmanned mining trucks, solving technical issues like communication disconnection.

ADDITIONAL INFORMATION

Languages: Mandarin Chinese (**Native**), English (**Fluent**, **IELTS: 6.5**)
Technical Skills: C++, Python, Matlab, Trucksim, Carsim, VTD