MIN HUA

Phone: +44 7579011104 ◇ **Email**: m.hua@bham.ac.uk
Google Scholar: Google Scholar Profile

EDUCATION

University of Birmingham, Birmingham, England Jun 2021 - May 2025
Ph.D. in School of Engineering

- Supervisor: Professor Hongming Xu
- Thesis: Multi-scale Energy Management for Multi-mode Hybrid Vehicles using Reinforcement Learning

College of Computing, Georgia Institute of Technology, USA Jan 2023 - Present
Online Master of Science Computer Science (OMS CS)

- Core courses: Deep learning; AI for robotics; Reinforcement learning, etc.

Jilin University, Changchun, China Sep 2016 - Jun 2019
MEng in Vehicle Engineering (with honors)

- Advisor: Professor Changfu Zong
- Thesis: Research on Autonomous Tracking Control of Intelligent Full Drive-by-Wire Electric Vehicle (Excellent Graduation Thesis Award)

Wuhan University of Technology, Wuhan, China Sep 2012 - Jun 2016
BEng in Vehicle Engineering (with honors)

- Advisor: Professor Miaohua Huang
- Thesis: Design of the Steer-by-Wire Control System for the Caravan

RESEARCH EXPERIENCE

University of Birmingham, Birmingham, England July 2025 - Present
Research fellow (full-time) to Professor Hongming Xu

- Leading the Development of AI-based Energy Management Strategies and Estimation of Critical States for Vehicle Stability with *BYD Automotive Company Ltd*(In the contract signing stage)

University of Birmingham, Birmingham, England Feb 2025 - June 2025
Research Associate (part-time) to Professor Hongming Xu

- Responsible for developing a research proposal on energy management technology for hybrid vehicles using large models, in collaboration with BYD.
- Leading the design and construction of a hardware-in-the-loop test bench to validate energy management strategies in real-time simulations.

University of Birmingham, Birmingham, England June 2021 - Jan 2025
Ph.D. Research (full-time) to Professor Hongming Xu

- Contributed to "Research on Real-time Optimisation System for Plug-in Hybrid Electric Vehicle based on Artificial Intelligence Digital Twin Technology" with *Jiangsu Industry Technology Research Institute* (925426) 120k at UoB (Total £420k)
- Contributed to "Digital Twin Modelling of Electrified Powertrain for Online Model Learning and Energy Management Control" with *Tsinghua University* (KF2029) (¥100k)

Chinese University of Hong Kong, Hong Kong, China Oct 2020 - Jan 2021
Research Associate (full-time) to Professor Yunhui Liu

- Developed and evaluated control schemes for precise trajectory tracking of small industrial trucks, comparing the performance of four kinematic control methods.

Jilin University, Changchun, China Oct 2016 - Mar 2019
Graduate Research (full-time) to Professor Changfu Zong

· Participated in "Reconfigurable integrated control of full drive-by-wire electric vehicles" funded by *National Natural Science Foundation of China*(51505178)(¥600k).

PROFESSIONAL EXPERIENCE

Baidu Technology Company - Apollo Company, Shenzhen, China Jan 2021 - Jun 2021
Planning and Control Algorithm Engineer

· Responsible for the design and calibration of intelligent vehicle control algorithms and dynamics models, while diagnosing and resolving development-stage issues.

SAIC Motor Passenger Vehicle Company, Shanghai, China Aug 2019 - Sep 2020
Intelligent Auxiliary System Engineer in Electronics and Electrical Department

· Responsible for research on AVM and TPMS systems, including Ethernet camera communication protocols, and developed an image stitching algorithm for AVM using image processing techniques.

Fabu.ai Co., Ltd., Hangzhou, China Jan 2019 - May 2019
Planning and Control Algorithm Engineer Intern

· Developed vehicle motion control algorithms on the ROS platform through dynamics modeling, filtering, and C++/Python implementation, with involvement in trajectory planning discussions.

AWARDS AND HONORS

- **Best Paper Award**, 27th IEEE International Conference on Intelligent Transportation Systems, 2024 (Top 0.1%)
- **Best Paper Award**, IEEE IV 2024 Workshop on Foundation Intelligence for Intelligent Vehicles, 2024 (Top 1%)
- **Silver Prize**, International "Internet +" Innovation and Entrepreneurship Competition, 2021 (Top 1%)
- **University of Birmingham Scholarship** (190,000 CNY/year), 2021 - 2025
- **Outstanding Employee**, Electronics and Electrical Department, SAIC Motor Passenger Vehicle Company, 2019 (Top 1%)
- **First Prize** at National Level (10,000 CNY), National Graduate Student Mathematics Modeling Contest, 2018 (Top 1%)
- **Graduate Outstanding Scholarships and Academic Scholarships** (24,000 CNY), 2017, 2018, 2019 (Top 10%)
- **Outstanding Graduate**, Wuhan University of Technology, 2016 (Top 5%)
- **National Scholarship** for Undergraduate Students (8,000 CNY), Wuhan University of Technology 2015 (Top 1%)
- **Third Prize**, National Mathematical Modeling Contest (1,000 CNY), 2014 (Top 5%)
- **National Inspirational Scholarship**, Wuhan University of Technology (5,000 CNY), 2013 (Top 3%)

EXTRACURRICULAR ACTIVITIES

Journal Reviewer 2021 - Present

IET Intell. Transp. Syst.; Proc. IMechE Part D: J. Automob. Eng.; Int. J. Powertrains; eTransp.; IEEE Trans. Intell. Transp. Syst.; IEEE Trans. Transp. Electr.; IEEE Trans. Intell. Veh.; IEEE Trans. Veh. Technol.; IEEE Trans. Serv. Comput.; SAE; IEEE ITSC 2022, 2021

Teaching Assistant in Engineering Department, 2021 - Present

PUBLICATION AND PATENTS

Journals (First/Co-First/Corresponding author)

1. **Hua, M.**, Zhang, C., Zhang, F., Li, Z., Yu, X., Xu, H., Zhou, Q., Energy management of multi-mode plug-in hybrid electric vehicle using multi-agent deep reinforcement learning, Applied Energy, 2023, Vol. 348, pp. 121526.(IF=11, JCR Q1)
2. **Hua, M.**, Chen, D., Jiang, K., Zhang, F., Wang, J., Wang, B., Zhou, Q. and Xu, H., Communication-Efficient MARL for Platoon Stability and Energy-Efficiency Co-Optimization in Cooperative Adaptive Cruise Control of CAVs, IEEE Transactions on Vehicular Technology, vol. 74, no. 4, pp. 6076-6087, April 2025. (IF=7.1, JCR Q1)
3. **Hua, M.**, Chen, D., Qi, X., Jiang, K., Liu, Z. E., Zhou, Q., Xu, H.. Multi-Agent Reinforcement Learning for Connected and Automated Vehicles Control: Recent Advancements and Future Prospects, IEEE Transactions on Automation Science and Engineering, vol. 22, pp. 16266-16286, 2025. (IF=6.4, JCR Q1)
4. **Min Hua**, Bin Shuai, Fanggang Zhang, Jinhai Wang, Cetengfei Zhang, Quan Zhou, and Hongming Xu. Efficient Energy Management of Plug-in Hybrid Electric Vehicles through Ensemble with In-target Minimization Q-learning. IEEE Transactions on Transportation Electrification, early access, 2025. (IF=8.3, JCR Q1)
5. Chen G., Yao J., Gao Z., Zhao Y., Liu C., Song S., **Hua, M.***.High Precision Data-mechanism-driven Lateral Velocity Estimation Using Transfer Learning in Distributed Vehicles, IEEE Transactions on Instrumentation & Measurement,2025. (* Corresponding author)
6. Chen, Guoying and Gao, Zheng and **Hua, Min***, and Shuai, Bin, and Gao, Zhenhai, Lane Change Trajectory Prediction Considering Driving Style Uncertainty for Autonomous Vehicles. Mechanical Systems and Signal Processing, Vol. 206, pp. 110854, 2024. (* Corresponding author)(IF=8.4, JCR Q1)
7. Shuai, Bin†, **Min Hua**†, Yanfei Li, Shijin Shuai, Hongming Xu, and Quan Zhou. Optimal Energy Management of Plug-in Hybrid Vehicles Through Exploration-to-Exploitation Ratio Control in Ensemble Reinforcement Learning. IEEE Transactions on Intelligent Vehicles, early access, 2024.(†Equal contribution) (IF=14 , JCR Q1)
8. Liu, W.†,**Hua, M.**†, Deng, Z., Meng, Z., Huang, Y., Hu, C., Xia, X. A systematic survey of control techniques and applications in connected and automated vehicles. IEEE Internet of Things Journal, vol. 10, no. 24, pp. 21892-21916, 2023.(†Equal contribution)(IF=10.6 , JCR Q1)
9. Guoying Chen, Xinyu Wang, **Min Hua***, Multi-level decision framework collision avoidance algorithm in emergency scenarios, Int. J. of Vehicle Design, vol. 95, no. 3-4, pp. 155-185, 2024. (* Corresponding author)(IF=0.5, JCR Q4)
10. **Min, H.**, Bin, S., Quan, Z., Wang, J., He, Y., Xu, H. Recent Progress in Energy Management of Connected Hybrid Electric Vehicles Using Reinforcement Learning. International Journal of Automotive Manufacturing and Materials, vol. 2, no. 4, pp. 6-22, 2023.
11. Chen, G., **Hua, M.***, Zong, C., Zhang, B., Huang, Y. Comprehensive chassis control strategy of FWIC-EV based on sliding mode control. IET Intelligent Transport Systems, vol. 13, no. 4, pp. 703-713, 2019.(IF=2.7, JCR Q2)
12. **Hua, M.**, Chen, G., Zhang, B., Huang, Y.. A hierarchical energy efficiency optimization control strategy for distributed electric vehicles. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering, vol. 233, no.3, pp. 605-621, 2019.(IF=1.7, JCR Q3)
13. **Hua, M.**, Chen, G., Zong, C., He, L.. Research on synchronous control strategy of steer-by-wire system with dual steering actuator motors. International Journal of Vehicle Autonomous Systems, vol. 15, no.1, 50-76, 2020.
14. Chen G., Yao J., Gao Z., Zhao Y., Liu C., Song S., **Hua, M.**†. Lateral Velocity Estimation Utilizing Transfer Learning Characteristics by a Hybrid Data-mechanism-driven Model. In2024 IEEE Intelligent Vehicles Symposium (IV) 2024 Jun 2, pp. 460-465. IEEE. (Oral presentation,† Corresponding author, **Best paper award**)

15. Wei Liu, Jiaqi Zhu, Guirong Zhuo, Wufei Fu, Zonglin Meng, Yishi Lu, Min Hua, Feng Qiao, You Li, Yi He, Lu Xiong, UniMSF: A Unified Multi-Sensor Fusion Framework for Intelligent Transportation System Global Localization,2024 IEEE 27th International Conference on Intelligent Transportation Systems (ITSC), 2024. (**Best paper award**)

16. Chen G.,**Hua, M.**†.A Bayesian-Tuned Proximal Policy Optimization Framework with Non-Parametric Rewards for Semi-Active Suspension Control, Engineering Applications of Artificial Intelligence,2025.(† Corresponding author, under review)

17. Hongyu Sun, **Hua, M.**†. SceDiT: Safety-Critical Scenario Generator based on Diffusion in Transformers, Engineering Applications of Artificial Intelligence,2025. († Corresponding author, under review)

18. Hongyu Sun, **Hua, M.**†. Learning Energy Management Strategies for PHEVs Using a Transformer Decoder-Only Architecture Guided by Dynamic Programming, Energy, 2025. († Corresponding author, under review)

Book Chapter Contributor

1. Daneshvar, et al. Physics-Aware Machine Learning for Integrated Energy Systems Management. Chapter Title: Bin Shuai1, Hao Zhang, **Min Hua**, Beiyan Jiang, Zhi Wang, Shengbo Eben Li, *Model-Free Reinforcement Learning for Integrated Energy Control of Hybrid Road Vehicles*, 2024.

Patent

1. **Min Hua**, A new type of small motor test bench for vehicles, Chinese Patent, 2017.