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Education Background

- **Zhejiang University** *Robotics* Master of Science 2019.09 – 2022.03
- **Zhejiang University** *Control Science and Engineering* Bachelor of Engineering 2015.09 – 2019.09
- **University of California, Berkeley** *Summer Session* Exchange Student 2017.07 – 2017.09

Research Field

- Autonomous Driving, Mobile Robots, Multi-agent System, Reinforcement Learning

Work Experience

- **Shanghai Artificial Intelligence Laboratory** *Researcher* 2022.06 – Present
 - Conduct research in the autonomous driving department. Focus on resolving decision and planning problems between multiple vehicles in complex traffic scenarios. In charge of developing an novel AD simulation in a data closed-loop way, which revolutionized the testing process of L4 autonomous driving systems.
- **Robotics X, Tencent** *Robotics Engineer Intern* 2021.06 – 2021.09
 - Developed a robotics modelling and control toolbox in C++. Focus on solving robot dynamics equations and model-based control planning problems. Tested and debugged the toolbox to ensure high performance and reliability in real-world applications like the quadruped robots Jamoca and Max.
- **X Lab, Inceptio** *Autonomous Driving Intern* 2021.02 – 2022.05
 - Proposed a learning-based micro-traffic flow driving model for highway scenarios, ideal for providing traffic flow simulation for autonomous driving. Trained and tested the hierarchical model using real highway driving datasets in SUMO, outperforming traditional IDM driving models.
- **Tmall Group, Alibaba** *Software Develop Engineer Intern* 2018.07 – 2018.09
 - Collaborated with a team to design automated testing software to protect against large-scale DDOS attacks during the Double 11 festival.

Academic Research

- **APRIL Laboratory** *Zhejiang University* 2019.09 – 2022.03
 - Published multiple academic papers related to robotics and multi-agent system in several top-tier conferences and journals.
 - Propose a hierarchical search algorithm for the multi-agent path finding problem (CL-MAPF) based on Ackermann model kinodynamic constraints. Its high level uses a body conflict search tree to consider the collision problem between vehicles, and its low level introduces a spatio-temporal hybrid A* algorithm as a single-body path planner. The open-sourced code has gained 150+ stars on [GitHub](#).
 - Propose a decentralized, locally observed reinforcement learning algorithm to solve multi-agent in formation (MAiF) tasks. The algorithm uses a hierarchical reinforcement learning structure to decompose the multi-objective task into mutually decoupled tasks. Experimental results show that our algorithm has good mobility for map size variations.

- **ZJUNlict RoboCup Team** *Zhejiang University* 2016.09 – 2019.09
 - Core member of software group. Focused on computer vision and AI strategy.
 - Rewrote vision module with a friendly interface and enable AI to acquire more information from the field. Applied a brand-new position filter to our 150k+ LOC program to get more stable and accurate position using binocular vision. Use collision detect algorithm to monitor the objects collision between robots.
 - Two years as World Champions and highlights of our team's matches can be [viewed here](#).

Publications

- **L. Wen**, P. Cai, D. Fu, S. Mao, Y. Li, "Bringing diversity to autonomous vehicles: An interpretable multi-vehicle decision-making and planning framework," Proceedings of the 22nd International Conference on Autonomous Agents and MultiAgent Systems (AAMAS), 2023, arxiv:[2302.06803](#)
- **L. Wen**, Y. Liu and H. Li, "CL-MAPF: Multi-Agent Path Finding for Car-Like robots with kinematic and spatiotemporal constraints," Robotics and Autonomous Systems, 2022, doi:[10.1016/j.robot.2021.103997](#)
- S. Liu, **L. Wen**, J. Cui, X. Yang and Y. Liu, "Moving Forward in Formation: A Decentralized Hierarchical Learning Approach to Multi-Agent Moving Together", 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021, pp. 4777-4784, doi:[10.1109/IROS51168.2021.9636224](#)
- **L. Wen**, J. Yan, X. Yang, Y. Liu and Y. Gu, "Collision-free Trajectory Planning for Autonomous Surface Vehicle," 2020 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Boston, MA, USA, 2020, pp. 1098-1105, doi:[10.1109/AIM43001.2020.9158907](#)
- Z. Huang, L. Chen, J. Li, Y. Wang, Z. Chen, **L. Wen**, J. Gu, P. Hu, R. Xiong, "RoboCup SSL 2018 Champion Team Paper." Robot World Cup. Springer, Cham, 2018: pp. 401-412, doi:[10.1007/978-3-030-27544-0_3](#)

Honors & Awards

- **RoboCup 2019, Sydney** *World Champion* 2019.06
- **RoboCup 2018, Montreal** *World Champion* 2018.08
- **Excellent project of Tmall, Alibaba Group** 2018.07
- **MCM (The Mathematical Contest in Modeling)** *Honorable Mention* 2018.02
- **Outstanding Student Leader Award, Zhejiang University** 2017.10
- **Excellent Young Volunteer, Zhejiang Province** 2016.10
- **Excellent Social Participate Scholarship, Zhejiang University** 2016.06
- **China National Olympiad in Informatics in Provinces** *First Prize* 2013/2014