Mingyi Wang

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Education

Zhejiang University Zhejiang, China
Master in Control Engineering 09/2022 – 03/2025

- College of Control Science and Engineering
- **Advisors:** Prof. Guang Li and Prof. You Wang

Zhejiang University Zhejiang, China
B.E. in Automation 09/2018 – 06/2022

- College of Control Science and Engineering
- Cumulative GPA: **3.90/4.00** (**Top 10%**)

RESEARCH INTERESTS

Mobile Robots, Autonomous Driving, Motion Planning, Motion Prediction

SELECTED PUBLICATIONS

1. **Wang, M.**, Zou, H., Liu, Y., et al. (2024). "A Joint Prediction Method of Multi-Agent to Reduce Collision Rate". *2024 China Automation Congress (CAC).*
   Link: [Paper]
2. Li, H., **Wang, M.**, Gao, H., Zhao, S., Li, G., & Wang, Y. (2023). "Hybrid Silent Speech Interface Through Fusion of Electroencephalography and Electromyography". *2023 Conference of the International Speech Communication Association (INTERSPEECH).*
   Link: [Paper]
3. Zhang, Z., Zou, Z., Li, X., **Wang, M.**, Wang, Y., & Guan, X., et al. (2023). "Path Planning for Autonomous Driving with Curvature-considered Quadratic Optimization". *2023 IEEE Intelligent Vehicles Symposium (IV).*
   Link: [Paper]
4. Zou, Z., Zhang, Z., Lu, Z., Li, X., **Wang, M.**, & Wang, Y., et al. (2023). "Discrete States-Based Trajectory Planning for Nonholonomic Robots". *2023 IEEE International Conference on Robotics and Biomimetics (ROBIO).*
   Link: [Paper]
5. Lu, Z., **Wang, M.**, Yu, S., Wu, Y., Wang, Y., & Li, G. (2023). "Camera-Lidar-Based Terrain Multi-type Classification Using Both Spatial and Histogram Features of Lidars". *2023 3rd International Conference on Computer, Control and Robotics (ICCCR).*
   Link: [Paper]

RESEARCH EXPERIENCE

★ AutoLab & UDEER.AI (Former Alibaba DAMO Academy Autonomous Driving Team)
Advised by Independent Prof. Kaicheng Yu and Dr. Junbo Chen 05/2024 — Now

- **Reinforcement Learning for Motion Planning and Prediction** [Project Page]
- Implemented MotionLM from scratch, proposed an autoregressive trajectory prediction model capable of generating agent action sequences in a GPT-like manner. This also ensures that the generated trajectory actions are differentiable. Our approach can generate the trajectories of all agents in a scene using a single inference (rollout), and employs a sampling method to model trajectory multimodality.
- Proposed a reinforcement learning method using the Advantage Function to mitigate the Out of Distribution issues, enabling our model to outperform previous approaches.
- During the reinforcement learning process, our model overcomes the issue of low interaction efficiency between the agent and the environment by directly utilizing model rollouts to sample sequences for MCTS, making it highly efficient compared to previous reinforcement learning methods.

★ DJI Automotive Planning and Control Department Shenzhen, China
Advised by Dr. Lu Zhang 08/2023 — 02/2024

- **Multi-agent Motion Prediction** [Paper]: Drawing on insights gained from this research experience, I proposed a method for generating scene-consistent multi-agent trajectories aimed at reducing collision rates.
- Developed a learning-based planning model inspired by trajectory prediction, utilizing perceptual inputs to generate planned paths and cost maps for downstream routing and evaluation.
- Awarded "Sprint Star" for outstanding performance in the planning and decision-making department, becoming the first intern to receive this honor independently.

★ Spherical Robotics Laboratory Hangzhou, China
Advised by Associate Prof. You Wang 09/2022 — 07/2023

- **Discrete State Trajectory Optimization** [Paper]: Based on DSTP, I incorporated kinematic constraints of spherical robots into trajectory optimization modeling.
- Using a discrete state optimization framework and the L-BFGS optimizer, I transformed the constraint problem into a soft constraint problem, generating real-time and high-quality trajectories.
- Our spherical robot project was awarded the Gold Medal at the 18th "Challenge Cup" in Zhejiang Province(2/18).

★ ZJU Undergraduate Graduation Project Hangzhou, China
Advised by Prof. Guang Li 11/2021 — 10/2022

- **Silent Speech Interface Through Bioelectric Signals** [Paper]
- Designed the experimental protocol for electroencephalography(EEG) and electromyography(EMG) data collection, and gathered data from multiple participants to build a dataset.
- Proposed a deep learning method that combines EEG and EMG signals, integrated with a vocoder, to reconstruct speech from muscle movements. This research has the potential to assist individuals with aphasia in producing speech.

HONORS & AWARDS

- 2019 First-Class Scholarship of Zhejiang University (**top 10%**)
- 2019 Zhejiang Provincial Government Scholarship (**top 8%**)
- 2020 First Prize in the 12th National College Student Mathematics Competition
- 2020 Zhejiang University Kindness Scholarship
  Awarded for outstanding contributions made during volunteer teaching in Haidong, Qinghai Province
- 2022 Outstanding Graduate of Zhejiang Province (**8/152**)

SKILLS

- **Programming:** Python, PyTorch, C/C++, Git, Matlab.
- **Robotics:** ROS, Linux, IoT chips(STM32, Arduino).
- **Soft skills:** Responsible, team-oriented, with a positive and optimistic attitude towards challenges.