

WENHAO YU

Robot Learning; Embodied AI; Automatic Driving

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🎓 EDUCATION

University of Science and Technology of China Sep. 2024 – Present

PhD student in Computer Technology

University of Science and Technology of China Sep. 2021 – Jul. 2024

Master student in Computer Technology, GPA: 3.75/4.3

Qingdao University Sep. 2017 – Jul. 2021

Bachelor student in Computer Science & Technology, GPA: 88.17/100

📖 PUBLICATIONS

DynaHMRC: Decentralized Heterogeneous Multi-Robot Collaboration for Dynamic Tasks with Large Language Models | Under Review Nov. 2025

- **Wenhao Yu**, Yang Xie, Yifan Duan, Jie Peng, Guanting Ye, Ka-Veng Yuen, Yanyong Zhang, Jianmin Ji
- DynaHMRC is a decentralized LLM-driven multi-robot framework that overcomes centralized context limits, adapts to dynamic tasks, and boosts domain-specific competence for scalable, efficient collaboration.

LDP: A Local Diffusion Planner for Efficient Robot Navigation and Collision Avoidance | IROS 2024 Jun. 2024

- **Wenhao Yu**, Jie Peng, Huanyu Yang, Junrui Zhang, Yifan Duan, Jianmin Ji, Yanyong Zhang
- Model the multi-modal expert policy distribution with multiple scenarios and preferences by diffusion model for robot navigation and collision avoidance.

PathRL: An End-to-End Path Generation Method for Collision Avoidance via Deep Reinforcement Learning | ICRA 2024 Jan. 2024

- **Wenhao Yu**, Jie Peng, Quecheng Qiu, Hanyu Wang, Lu Zhang, Jianmin Ji
- a novel end-to-end DRL-based method, PathRL, that directly outputs navigation paths without relying on the supervised learning paradigm and is competent for a variety of complex scenarios.

STDArm: Transfer Visuomotor Policy From Static Data Training to Dynamic Robot Manipulation | RSS 2025 Apr. 2025

- Yifan Duan, Heng Li, Yilong Wu, **Wenhao Yu**, Xinran Zhang, Yedong Shen, Jianmin Ji, Yanyong Zhang
- This paper presents STDArm, a system that transfers static-trained visuomotor policies to dynamic robots, achieving precise and stable manipulation through real-time action correction without retraining.

CalibWorkflow: A General MLLM-Guided Workflow for Centimeter-Level Cross-Sensor Calibration | ACM MM 2025 Jul. 2025

- Xingchen Li, Wuyang Zhang, Guoliang You, Xiaomeng Chu, **Wenhao Yu**, Yifan Duan, Yuxuan Xiao, Yanyong Zhang
- CalibWorkflow is a generalizable extrinsic calibration framework that uses MLLMs as visual guides to search, optimize, and refine parameters, enabling robust, hardware-agnostic calibration across diverse sensors and environments.

🐾 PROJECT EXPERIENCE

Advanced Autonomous Driving Decision-Making and Control Algorithm Development | Project Leader Dec. 2023 – Dec. 2024

Developed and deployed advanced autonomous driving decision-making and control algorithms for complex urban traffic scenarios, integrating traditional planning methods with reinforcement learning techniques to achieve

efficient and safe autonomous driving.

- **Algorithm Development:** Designed offline reinforcement learning-based decision-making methods combined with optimization-based traditional planning algorithms to ensure driving safety and stability.
- **System Deployment:** Migrated and optimized algorithms on an industrial computer and MDC joint hardware platform, conducting real-vehicle debugging to ensure stability and reliability in complex scenarios.

Development of autonomous driving system for underground auxiliary transportation |

Decision-making and Planning Module Leader

Dec. 2022 – Dec. 2023

For multi-layer underground tunnel transportation scenarios, we have developed, tested, and delivered an autonomous driving prototype system that integrates perception, modeling, localization, planning, and remote control capabilities, accompanied by multiple patented technologies.

- **Driving Scenarios:** Develop global path planning algorithms based on search and manually designated strategies and local motion planning algorithms based on optimization to navigate complex environments.
- **Parking Scenarios:** Develop parking algorithms that combine Hybrid A* and TEB planning methods, enabling precise roadside temporary parking and accurate parking within parking lots.
- **Convoy Scenarios:** Develop convoy driving algorithms that utilize vehicle-to-vehicle communication, allowing following vehicles to track the lead vehicle, supporting coordinated convoy transportation.
- **Hazard Scenarios:** Implement hazard detection mechanisms that work in collaboration with remote control modules to ensure safe operation in hazardous situations.

Autonomous Logistics Vehicle Planning Algorithm Development | Project Leader Mar. 2023 – Jun. 2023

Developed and deployed decision-making, planning, and control algorithms for autonomous logistics vehicles within a research institute campus, enabling point-to-point deliveries.

- **System Deployment:** Developed Cyber RT and ROS message conversion modules on the Arm platform and deployed them on the NVIDIA Xavier hardware platform using Docker containerization technology.
- **Algorithm Development:** Designed and implemented planning and control algorithms, conducted joint debugging with the SLAM module on real vehicles, and achieved reliable point-to-point deliveries within the campus.

HONORS AND AWARDS

First-Class Scholarship for multiple academic years

Sep. 2022/2023/2024/2025

Outstanding Communist Youth League Member of USTC

Jun. 2022

National Encouragement Scholarship

Dec. 2018

SKILLS

- **Programming and tools:** Python/PyTorch, C/C++, Gazebo/Pybullet/Isaac Lab, ROS, Cmake, Linux, Git, Visual Studio, Microsoft Office
- **Languages:** Mandarin(native), English(CET-6)

于文豪

机器人学习 | 具身智能 | 自动驾驶

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🎓 教育背景

中国科学技术大学	博士, 计算机技术	2024 年 9 月 – 目前
中国科学技术大学	硕士, 计算机技术, 成绩: 3.75/4.3	2021 年 9 月 – 2024 年 7 月
青岛大学	学士, 计算机科学与技术, 成绩: 88.17/100	2017 年 9 月 – 2021 年 7 月

📖 论文

DynaHMRC: 基于大语言模型的动态任务去中心化异构多机器人协作 | 审稿中 2025 年 11 月

- 于文豪, 谢宇昂, 段逸凡, 彭杰, 叶冠廷, 阮家荣, 张燕咏, 吉建民
- DynaHMRC 是一个去中心化的、由大语言模型驱动的多机器人框架, 它克服了集中式上下文限制, 能够适应动态任务, 并提升特定领域的能力, 以实现可扩展、高效的协作。

LDP: 一种用于高效机器人导航和碰撞避免的局部扩散规划器 | IROS 2024 2024 年 6 月

- 于文豪, 彭杰, 杨环宇, 张君瑞, 吉建民, 张燕咏
- 通过扩散模型对具有多种场景和偏好的多模态专家策略分布进行建模, 以实现机器人导航和防撞。

PathRL: 一种通过深度强化学习实现机器人导航碰撞避免的端到端路径生成方法 | ICRA 2024 2024 年 1 月

- 于文豪, 彭杰, 裘懋成, 王晗宇, 张露, 吉建民
- 一种新颖的基于端到端 DRL 的方法 PathRL, 它无需依赖监督学习范式即可直接输出导航路径, 并且能够胜任各种复杂场景。

STDarm: 将视觉运动策略从静态数据训练转移到动态机器人操作 | RSS 2025 2025 年 4 月

- 段逸凡, 李衡, 吴毅龙, 于文豪, 张鑫燃, 沈叶栋, 吉建民, 张燕咏
- 本文介绍了 STDarm, 这是一个将静态训练的视觉运动策略转移到动态机器人上的系统, 通过实时动作校正实现精确稳定的操作, 而无需重新训练。

CalibWorkflow: 一种用于厘米级跨传感器校准的通用大语言模型引导工作流程 | ACM MM 2025 2025 年 7 月

- 李星辰, 张午阳, 尤国良, 褚晓萌, 于文豪, 段逸凡, 肖宇轩, 张燕咏
- CalibWorkflow 是一个通用的外部校准框架, 它使用大语言多模态模型作为视觉引导来搜索、优化和细化参数, 从而能够在各种传感器和环境中进行稳健的、与硬件无关的校准。

🛠️ 项目经历

高阶自动驾驶决策规划算法开发 | 项目负责人 2023 年 12 月 – 2024 年 12 月

开发并部署针对复杂城市交通场景的高阶自动驾驶决策与控制算法, 将传统规划方法与强化学习技术相结合, 实现高效、安全的自动驾驶。

- 算法开发**: 设计基于离线强化学习的决策方法, 结合基于优化的传统规划算法, 保障行车安全稳定性。
- 系统部署**: 在工控机与 MDC 联合硬件平台上移植优化算法, 并进行实车调试, 确保复杂场景下的稳定性和可靠性。

井下辅助运输自动驾驶系统开发 | 决策规划模块负责人 2022 年 12 月 – 2023 年 12 月

面对井下多层巷道运输场景, 开发、调试与交付一套支持感知、建模、定位、规划以及支持远程控制的自动驾驶系统及多份专利。

- 行车场景**: 在复杂巷道场景中, 开发基于搜索和人工指定的全局路径规划算法, 以及基于优化的运动规划算法。
- 泊车场景**: 开发泊车算法, 结合 Hybrid A* 和 TEB 规划方法, 实现路边停车和停车场精准泊车。

- **编组场景**：开发编组行驶算法，通过车车通信，实现后车自适应跟随前车，支持编队协同运输。
- **危险场景**：实现危险检测机制，与远程控制模块协同工作，确保系统在危险场景安全行驶。

无人物流车规划算法开发 | 项目负责人

2023 年 3 月 – 2023 年 6 月

在研究院园区内开发部署无人物流车决策规划控制算法，实现园区内点对点送货。

- **系统部署**：在 Arm 平台上开发 Cyber RT 与 ROS 消息转换模块，并利用 Docker 容器化技术将其部署至 NVIDIA Xavier 硬件平台。
- **算法开发**：完成规划与控制算法的开发部署，与 slam 模块完成实车联合调试，实现园区内点对点送货。

🏆 荣誉和获奖

多次获得学业一等奖学金
中国科学技术大学优秀共青团员
国家励志奖学金

2022/2023/2024 年 9 月

2022 年 6 月

2018 年 12 月

⚙️ 个人能力

- **编程与工具**：Python/PyTorch, C/C++, Gazebo/Pybullet/Isaac Lab, ROS, Cmake, Linux, Git, Visual Studio, Microsoft Office
- **语言**：Mandarin(native), English(CET-6)