

Shangyi Luo

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🏠 [homepage](#)

RESEARCH INTERESTS

My research interests focus on perception and planning for unmanned vehicle navigation. I hope to improve the ability of robots to infer environmental information and navigate appropriately in complex human-centered environments. Ultimately, my goal is to contribute to the development of mobile robots that can adapt to various open-world scenarios.

EDUCATION

Harbin Institute of Technology

Sep 2021 - Present

B.E. in Automation (Shenzhen Campus), GPA: 86.331/100

Awards: First-Class Academic Scholarship

PUBLICATIONS

- [1] **S. Luo**, J. Zhu*, P. Sun*, Y. Deng, C. Yu, A. Xiao, X. Wang, "GSON: A Group-based Social Navigation Framework with Large Multimodal Model ", In submission to *International Conference on Robotics and Automation (ICRA)*.
[\[Paper\]](#) [\[Video\]](#)

EXPERIENCE

Center for Artificial Intelligence and Robotics, Tsinghua SIGS

Jan 2024 – Sep 2024

Research Intern with [Prof. Xueqian Wang](#)

Shenzhen, China

- Developed a group-based social navigation framework (GSON) to enable mobile robots to perceive and exploit the social group of their surroundings by leveling the visual reasoning capability of the Large Multimodal Model.
- Applied visual prompting techniques to zero-shot extract the social relationship among pedestrians and combined the result with a robust pedestrian detection and tracking pipeline.
- Proposed a novel planning framework that integrates a social structure-based mid-level planner between global path planning and local motion planning to preserve the global context and reactive response.

Bambu Lab

Jul 2024 – Oct 2024

Machine Learning Engineer Intern

Shenzhen, China

- Created a simulation environment of industrial scenes using Blender to support the data generation and testing pipeline for detection algorithm development.
- Applied YOLO and YOLO-world for few-shot, fine-tuning parameters to ensure effective object recognition with limited samples. Explored few-shot learning techniques with transfer learning and data augmentation to improve model accuracy and robustness in industrial applications.

PROJECTS

RoboMaster Infantry Robot Design and Optimization

Dec 2022 – Dec 2023

Main Contributor, RoboMaster Robotics Competition

- Focused on modular design, including gimbal, chassis, firing module, and wheel assembly, with an emphasis on weight reduction and cost control.
- Leveraged previous designs to upgrade a high-performance infantry robot with excellent firing, movement, and collision resistance capabilities.
- Lead young team members in overcoming technical challenges and accelerating the development of competitive, high-performance robots.

CADC Drone Power System and Payload Design

Oct 2023 - Dec 2023

Project Lead, China University Student Aircraft Design Innovation Competition

- Selected optimal power systems, such as motors, propellers, and batteries, based on mission requirements to ensure sufficient thrust and flight endurance.
- Designed an effective payload bay for the safe and accurate transportation and release of specified payloads.
- Conducted iterative flight tests to collect performance data, refining design, and control strategies to improve drone reliability and stability.

SKILLS

- **Programming:** C++, Python, Matlab, CMake, HTML, Data Structure and Algorithm
- **Tools:** LaTeX, Pytorch, Git, Linux, OS, Windows
- **Interest:** Table tennis, Badminton, Running
- **Languages:** Chinese: Native. English: Advanced (IELTS 7.0)

VOLUNTEER EXPERIENCE

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|--|--------------------------------|
| • Youth Volunteer Service Organization | <i>April 2022 - April 2023</i> |
| • Elderly Care Visits | <i>July 2021</i> |
| • Community Volunteer During Pandemic | <i>Jan 2021</i> |