Shangyi Luo

School of Mechanical Engineering and Automation
Harbin Institute of Technology, Shenzhen

lsylsy030516@gmail.com
homepage

Research Interests

My research focuses on modern perception and planning systems for mobile robots in human-centric environments. Recently, I have studied how to integrate vision-language models into classical navigation systems to achieve socially aware navigation.

Education

Harbin Institute of Technology *Sep 2021 - Present*
B.E. in Automation (Shenzhen Campus), CGPA: 86.331/100
Awards: First-Class Academic Scholarship

National University of Singapore *Incoming, Aug 2025*
Master of Computing (General Track)

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). [Paper] [Video]

Experience

Center for Artificial Intelligence and Robotics, Tsinghua SIGS *Octo 2023 – Present*
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.
- Designing a retrieval-augmented framework to resolve large-scale semantic ambiguity in outdoor navigation by synergizing aerial-view context and geospatial knowledge bases, with ongoing validation in wilderness search scenarios.

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 2021 – 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 *Apr 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

- Youth Volunteer Service Organization *April 2022 - April 2023*
- Elderly Care Visits *July 2021*
- Community Volunteer During Pandemic *Jan 2021*