

Jingfan Tang

Shanghai, China | tang_jingfan@sjtu.edu.cn | tangjingfan.github.io

Education

Shanghai Jiao Tong University <i>B.E. in Electrical & Computer Engineering, GPA: 3.847/4.0</i>	Sept 2023 – Aug 2027 (expected)
Carnegie Mellon University <i>Department of Electrical & Computer Engineering, College of Engineering</i>	Jan 2026 – May 2026 (expected)

Publications

PELP: Probabilistic Planning for Autonomous Exploration with Learning-Based Prediction

Jingfan Tang, Ruizhi Deng, Yunpeng Lyu, Shizhe Zhao, Zhongqiang Ren

In submission to *Robotics: Science and System (RSS)*

HEHA: Hierarchical Planning for Heterogeneous Multi-Robot Exploration of Unknown Environments

Longrui Yan, Yiyu Wang, *Jingfan Tang*, Yunpeng Lyu, Shizhe Zhao, Chao Cao, Zhongqiang Ren

In submission to *IEEE Transactions on Robotics (T-RO)*

Research Experience

Research Intern at Shanghai Jiao Tong University Mar 2025 – Present

Project: Hierarchical Autonomous Exploration System with Map Prediction

- Engineered a modular framework coupling neural-network-driven map prediction with hierarchical planning, boosting path-planning efficiency by **7–20%** over state-of-the-art baselines (e.g., TARE, P²explore).
- Formulated a **novel uncertainty-aware routing problem** and engineered **both optimal and bounded suboptimal solvers**; these algorithms dynamically evaluate probabilistic vertices to resolve map prediction inaccuracies and minimize collision risks in complex terrains.
- Successfully deployed and validated the proposed system on a physical robot platform AgileX Scout Mini in cluttered indoor/outdoor environments, demonstrating seamless sim-to-real transfer.

Project: Hierarchical Multi-Robot Exploration System for Heterogeneous Agents

- Developed a **hierarchical framework for autonomous exploration in multi-robot systems**, enabling efficient task allocation and path planning across heterogeneous agents.
- Optimized the local-stage planner, achieving a **16.5%** performance improvement in exploration efficiency and convergence speed over baseline.
- Designed and executed simulation-based experiments to validate system robustness and scalability under dynamic environments, reducing exploration time by **up to 30%** over baseline (e.g., NBVP).

Advisor: Prof. Zhongqiang Ren

Skills

- **Languages:** C, C++, Python, Matlab
- **Framework and Operating System:** Linux, Git, ROS (Robot Operating System)
- **Speaks:** Mandarin, English (TOEFL 107)

Services

- **Teaching Assistant of Course MATH2030J Discrete Mathematics**
Lecturer: Dr. Runze Cai.
- **Teaching Assistant of Course MATH2550J Honor Multivariate Calculus**
Lecturer: Dr. Runze Cai.
- **Reviewer for IROS 2026**