LIU, YONGCE (刘永策)

+8618940577099 | yongce.liu@sjtu.edu.cn | GitHub | Portfolio | Google Scholar

EDUCATION

Shanghai Jiao Tong University — Shanghai, China
Master, Control Science and Engineering (Advisor: REN, Zhongqiang, LAB: RAP LAB) — 09/2024 - 03/2027 (Expected)
Research Interests: Optimal Control, Motion Planning, Multi-Robot Systems.

Northeastern University — Shenyang, China
Bachelor of Engineering, Automation — 09/2020 - 06/2024
Rank: 2/187, GPA: 4.336/5 (93.36/100), Courses: Automatic Control Principle, Modern Control Theory.

PUBLICATIONS [GOOGLE SCHOLAR]

[1] Yongce Liu, Zhongqiang Ren. "A Probabilistic Measure of Multi-Robot Connectivity and Ergodic Optimal Control." Robotics: Science and Systems (RSS) [Accepted], 2025
- Propose a probabilistic connectivity measure, study connectivity maintenance methods under information (ergodic) search, and use augmented Lagrangian iterative-LQR as the trajectory planning method.

[2] Yongce Liu, Zhongqiang Ren. "Multi-Robot Ergodic Trajectory Optimization with Relaxed Periodic Connectivity." [Submitted to IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)], 2025.
- Research on multi-robot information search planning (ergodic search) and connectivity maintenance methods, using the augmented Lagrangian method as the numerical optimization method.

[3] Shizhe Zhao, Yongce Liu, Howie Choset, and Zhongqiang Ren. "Mixed Integer Conic Programming for Multi-Agent Motion Planning in Continuous Space." [Submitted to IROS], 2025.
- Studying multi-robot motion planning under collision-free paths, using Gurobi as the solver, I execute the hardware experiments to verify the algorithm.

[4] Yongce Liu, Ziyang Wu, and Pengcheng Song. "Online Trajectory Optimization for UAV-assisted Hybrid FSO/RF Network with QoS-guarantee." IEEE Communications Letters, 2023.
- Research on trajectory planning of the unmanned aerial vehicle based on reinforcement learning ensures the quality of service between air and ground (UAV - Ground Vehicle).

INTERNSHIP EXPERIENCE

ZERON Truck, Truck Autonomous Driving — Shanghai, China
Autonomous Driving Algorithm Intern
- Research on spatiotemporal joint trajectory planning for autonomous driving to plan safe and comfortable trajectories.
- Joint reinforcement learning end-to-end autonomous driving model to ensure the vehicle driving safety.

PROJECTS

[1] Ergodic Coverage of a Target Using a Manipulator or Quadrotor (Introduction to Robotics Course)
- Based on the ergodic search theory, plan a collision-free path for a manipulator or quadrotor to cover (moving) target objects.

[2] Trajectory Planning Library (Developing)
- Develop a trajectory planning library with optimization, sampling, and discrete search using C++ (LQR Series, RRT, A* Series, etc).

AWARDS & ACHIEVEMENTS

Outstanding graduates from Liaoning Province — 2024
National Scholarship (2.5%), Northeastern University Outstanding Student, etc — 2021, 2022, 2023
China University Student Computer Game Theory Competition, 1st Prize — 2021, 2022
Mathematical Contest in Modeling (MCM), 1st Prize — 2022
Outstanding College Students in Shenyang (0.5%) — 2021

OPEN SOURCE REPOSITORY

Motion Capture Deck [GitHub] : The active and passive deck to position the Crazyflie 2.x in a motion capture system.

TECHNICAL SKILLS

Programming: Python (NumPy, Matplotlib, JAX, PyTorch), C++ (Eigen)
Software: Linux, Docker, Git, Robot Operating System (ROS & ROS2), LATEX