Junbin Yuan

Ph.D. Candidate
Department of Mechanical Engineering
Carnegie Mellon University

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Junbin Yuan
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Education

Carnegie Mellon University 09/2022 – Present
Ph.D. in Mechanical Engineering Pittsburgh, PA, USA

- Advisor: Prof. Sebastian Scherer
- Anticipated Graduation: 2027
- QPA: 3.95 / 4.0

Hong Kong University of Science and Technology 09/2015 – 07/2019
B.Eng. in Electronic and Computer Engineering Hong Kong, China

- Minor in Mathematics & Minor in Aerospace Engineering
- Cumulative GPA: 3.83 / 4.3, First Class Honors

Massachusetts Institute of Technology 01/2018 – 05/2018
Special Student Program Cambridge, MA, USA

- Cumulative GPA: 4.3 / 5.0

Appointments

Carnegie Mellon University 09/2019 – 03/2022
Research Associate in Robotics Institute Pittsburgh, PA, USA

- Advisor: Prof. Sebastian Scherer
- Contributed to multiple research projects on autonomous aerial robotics, including perception, planning, and system integration.

Research Experience

Semantic-Aware Autonomous Inspection for Construction Sites 2025 – Present
Ph.D. Student Pittsburgh, PA, USA

- Leading a research project on autonomous inspection for construction sites, conducted in collaboration with the Institute of Technology, Shimizu Corporation, with a focus on semantic-aware inspection and perception-aware planning in complex environments.

Autonomous Mission Execution for Reconnaissance UAVs 2021 – 2025
Research Associate / Ph.D. Student Pittsburgh, PA, USA

- Supported team research on target search in an Office of Naval Research–funded research project through simulation-based infrastructure development and system integration, enabling large-scale experimental evaluation.
- Developed autonomy algorithms for multi-target tracking using UAVs, focusing on decision-making with dynamic targets under uncertainty.

Autonomous Infrastructure Inspection with Aerial Robots 2019 – 2021
Research Associate Pittsburgh, PA, USA

- Contributed to a long-term industry–academic collaboration with Institute of Technology, Shimizu Corporation on autonomous infrastructure inspection. Made substantial contributions to the development and maintenance of autonomous flight capabilities, including system integration for sensor calibration, state estimation, and planning modules.

Publications

Journal Articles

J. Yuan, B. Moon, M. Cao, and S. Scherer. "Hierarchical Planning for Long-Horizon Multi-Target Tracking Under Target Motion Uncertainty," *IEEE Robotics and Automation Letters*, 2025.

B. Moon, S. Sachdev, **J. Yuan**, and S. Scherer, "Time-Optimal Path Planning in a Constant Wind for Uncrewed Aerial Vehicles Using Dubins Set Classification," *IEEE Robotics and Automation Letters*, 2024.

Under Review

B. Moon, N. Suvarna, A. Jong, S. Chatterjee, **J. Yuan**, M. Cao, and S. Scherer, "IA-TIGRIS: An Incremental and Adaptive Sampling-Based Planner for Online Informative Path Planning," revised submission to *IEEE Transactions on Robotics*.

Professional Service

Reviewer

IEEE Transactions on Field Robotics
IEEE Robotics and Automation Letters

Technical Skills

Programming & Systems: C++, Python, MATLAB, Docker

Robotics & Simulation: ROS/ROS2, Gazebo, Isaac Sim

UAV Platforms: PX4, DJI SDK, Ardupilot