Dongnan Hu

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WORKING

National University of Singapore **Singapore**
Research Assistant in Mechanical Engineering *September,2025-Present*
Supervisor: Prof. Guillaume Sartoretti

Bilibili (Chinese version Youtube)
UAV Technical Video Creator *June,2025-Present*
Account Homepage: `https://b23.tv/Q1rSYbx`
Subscriber Count: 3500 (Up to May, 2026)

EDUCATION

East China University of Science and Technology **Shanghai, China**
M.S. in Control Engineering *September,2021-June,2024*
Supervisor: Prof. Yang Tang (IEEE Fellow)
GPA: 84.75/100 (9th among 182 students)

Nanjing Tech University **Nanjing, China**
B.S. in Mechanical Engineering *September,2018-June,2020*
GPA: 83/100

Suzhou Vocational University **Suzhou, China**
Vehicle Inspection and Maintenance Technology *September,2015-July,2018*
GPA: 83.6/100

PUBLICATIONS

- **IECON2024** *"Trajectory Planning and Tracking of Hybrid Flying-Crawling Quadrotors"*
  Dongnan Hu, Ruihao Xia, Xin Jin, Yang Tang.
  Accepted by the 2024 Annual Conference of the IEEE Industrial Electronics Society

Preprint: https://arxiv.org/abs/2312.08718
Attached Video: https://youtu.be/nxFqLxel4c0

ENGINEERING EXPERIENCE

"Deep Reinforcement Learning based Multi-UAV Target Search in Low Rise Urban Environments"
Supervised by Prof. Guillaume Sartoretti *September,2025-May,2026*

- Assembled a UAV and integrated an onboard computer, flight controller, and LiDAR.
- Built a ROS 2–based UAV autonomous navigation system: integrating reinforcement learning (exploration and goal generation)-> trajectory planning (planning trajectories to the goal)-> PX4-based controller (trajectory tracking).
- A swarm composed of three UAVs was constructed to perform autonomous multi-UAV exploration.

"Motion planning and control of a morphing quadrotor in restricted scenarios"

Supervised by Prof. Yang Tang *February,2023-April,2023*

- Structural design and assembly of a morphing UAV.

RESEARCH EXPERIENCE

"Trajectory Planning and Tracking of Hybrid Flying-Crawling Quadrotors"
Supervised by Prof. Yang Tang *June,2022-November,2023*

- The quadrotor relies on flight autopilot for crawling, limiting its ability to control motor speeds and track trajectories with large yaw deviations. To address this, I constrained the yaw angle range of the ground primitives in the hybrid trajectory to align with its crawling and flying capabilities.
- Given the processing time on model transition, the quadrotor cannot track the trajectory during transitions between terrestrial and aerial phases. I developed a trajectory-tracking algorithm by avoiding the tracking of terrestrial-aerial junctions and re-planning the trajectory, compensating for the disadvantage of the extended deformation time required by the quadrotor.

RESEARCH INTEREST

Autonomous Navigation, Motion Planning and Control, Mobile Robots

AWARDS AND ACHIEVEMENTS

- Second-class Scholarship for Master's Academic Achievement in the session of 2022-2023.
- First-class Scholarship for Master's Academic Achievement in the session of 2021-2022.
- Second Prize in the 18th "Huawei Cup" Chinese Graduate Mathematical Modeling Competition in December 2021.

KEY SKILLS

Programming Language	C/C++,Python
Research Tool	Matlab
Robot Tool	ROS1,ROS2,PX4
Mechanical software	Solidworks, Catia, Workbench

SELF EVALUATION

- **Solid mathematical and physics foundation.** I achieved high grades in courses such as Matrix Theory (87/100), and Principle and Application of Pattern Recognition (88/100).
- **Experienced in robot software development.** Proficient in C/C++, Python. Experienced with ROS and PX4. Possess 2 years of development experience in the Linux environment, capable of independently completing robotic task development.
- **Strong mechanical design skills.** I adeptly utilize CAD software to transform intricate mechanical designs from conceptualization to reality.
- **Proficient in the integration, testing, and maintenance of mechatronic systems.** I have created a transformable hybrid flying-crawling quadcopter, completing all tasks independently, including mechanical structure design, manufacturing, electronic unit integration, functionality debugging, motion planning and control, as well as autonomous navigation system integration.