

BOTAO HE

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EDUCATION

University of Maryland, College Park, U.S. **08/2022 – Now**

Ph.D. student in Computer Science.

Nanjing Institute of Technology, Nanjing, China **09/2018 – 07/2022**

B.Eng. in Robot Engineering, School of Automation.

GPA: 87.5/100, Comprehensive Ranking: 1/45, GPA Ranking: 2/45

PUBLICATIONS AND PATENTS

- Qianhao Wang*, **Botao He***, Zhiren Xun and Fei Gao.
"GPA-Teleoperation: Gaze Enhanced Perception-aware Safe Assistive Aerial Teleoperation"
IEEE Robotics and Automation Letters (**RA-L**) and IEEE International Conference on Robotics and Automation (**ICRA 2022**). [[Paper](#)] [[Video](#)] [[Code](#)]
- **Botao He***, Haojia Li*, Siyuan Wu, Dong Wang, Zhiwei Zhang, Qianli Dong, Chao Xu, and Fei Gao.
"FAST-Dynamic-Vision: Detection and Tracking Dynamic Objects with Event and Depth Sensing"
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2021**). [[Paper](#)] [[Video](#)] [[Code](#)]
- Shaohui Yang, **Botao He**, Zhepei Wang, Chao Xu and Fei Gao.
"Whole-Body Real-Time Motion Planning for Multicopters,"
IEEE International Conference on Robotics and Automation(**ICRA 2021**), [[Paper](#)] [[Video](#)]
- **Botao He**, Zijie Zhuang, Guifang Qiao, Youlin Ren.
"An Integrated Knee Joint Design for Lightweight Quadruped Robot"
Patent NO.201920948634.8

EXPERIENCE

FAST(Field Autonomous System & compuTing) Lab, Zhejiang University **01/2020 – 08/2022**

Advanced Pilot Assistance System (APAS). Advised by Prof. [Fei Gao](#)

- Proposed a gaze enhanced assistive aerial teleoperation framework considering topological intent consistency and perception awareness. Make drone operation easy for everyone.
- Designed a topological path generation method, which significantly improves intention consistency.
- Will be published at **RA-L and ICRA 2022** ([preprint](#)). To be open-sourced on [Github](#).

Event-based perception. Advised by Prof. Fei Gao

- Proposed a perception system for dodging fast-moving objects with low latency and high precision.
- Designed the ego-motion compensation algorithm that balances efficiency and accuracy.
- Implemented a novel moving object detection method that enables the drone to robustly detect high-speed (>12m/s) incoming object while flying at 1.5m/s.
- Published at **IROS 2021** ([preprint](#)). Open-sourced on [Github](#). Reported by media and got over 30,000 visits.

Whole-body Motion Planning for UAVs. Advised by Prof. Fei Gao

- Proposed a full-body, optimization-based, yaw-considered real-time motion planning framework for aerial robots. The time consumption and memory usage of our method surpasses others.
- Worked on real-world experiment implementation. Got familiar with the aerial motion planning framework.
- Published at **ICRA 2021** ([preprint](#)).

Intelligent Pipeline Department, Zhejiang University & Zhejiang Energy Group **03/2020 – 06/2020**

UAV natural gas pipeline inspection in Zhejiang Province.

- Proposed a complete system for industry application, including autonomous flight and inspection.
- Designed an emergency avoidance framework for UAV's breakdown during flight. Our system is able to save people from inspecting in dangerous places like cliffs and depopulated zones!

All-terrain Vehicle Lab, Nanjing Institute of Technology

10/2018 – 12/2019

Challenge Arena Fighting Robot. Advised by Prof. [Guifang Qiao](#)

Team leader

Electromagnetic Throw System.

Team leader

Lightweight quadruped robot.

Team leader

- Acquired the ability to independently build a robot system. Won a **first prize**, a **second prize** in national competitions, and several provincial prizes. More details in my [personal page](#).

HONORS & AWARDS

First Class Academic Excellence Award (5%), NJIT 2018-2021

First Prize of Jiangsu province, National College Student Electronics Design Contest 2019

Second Prize, National Intelligent Robot Fighting Competition 2019

Third Prize, The 8th National University Contest on Intelligent Robotic Innovations 2019

SKILLS

Programming: C/C++, Python, Keil-C, Matlab, Git, OpenCV.

Robotics: ROS, Airsim, Gazebo, Adams, IoT chips(STM32, Arduino).

Hardware: SolidWorks, machining, circuit design.

ADDITIONAL ACTIVITIES

Summer volunteering at the Wangmengzhuang Primary School in Peixian. Taught Maths, Astronomy, PE, and Sex-education.

Volunteer teaching assistant at community autism school. 250+ volunteer hours in total.