

JIANG Zixing

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EDUCATION

- M.Phil. Surgery, CUHK, In progress 2024–
 Research Topic: Robotic Ultrasound Imaging and Ultrasound-Guided Biopsy, supervised by Prof. LI Zheng
- B.Eng. Electronic Information Engineering, *First-Class Honors*, CUHK-Shenzhen, 2023
 Final Year Project: Control of the Multi-Joint Manipulator for Grasping on Water Surface, supervised by Prof. QIAN Huihuan

PROFESSIONAL EXPERIENCE

- 2023–24 Advanced Bio-Medical Robotics Laboratory (ABML), CUHK
 Research Assistant, Robotic Ultrasound Project
- 2020–23 Robotics & Artificial Intelligence Laboratory (RAIL), CUHK-Shenzhen
 Research Intern, Medical Robotics Group, 2023.02–08
 Research Intern, Marine Robotics Group, 2020.09–2023.02

RESEARCH INTERESTS

Robotics: Calibration, Perception, Motion Planning & Control

Medical Robotics: Image-Guided Robotic Interventions, Robot-Assisted Imaging

SELECTED PROJECTS



Robotic Ultrasound Imaging
ABML, CUHK, 2023–

Participating in a research project aimed at developing a robotic system for teleoperated and autonomous ultrasound examinations.

My contributions: system integration; development of core algorithms including visual servoing, force control, motion planning, teleoperation, etc; assistance in conducting preclinical validation for lung ultrasound applications.



Robot-Assisted Prostate Biopsy
ABML, CUHK, 2024–

Participating in a research project aimed at developing an assistive navigation robot for ultrasound-guided transperineal prostate biopsy.

My contributions: development of navigation and visualization interface; assistance in conducting clinical trials.



USV-UAV Cooperative System RAIL, CUHK-Shenzhen, 2020–23

Engaged in a research project aimed at developing an unmanned surface vehicle (USV) as a carrier for unmanned aerial vehicles (UAVs) for marine applications.

My contributions: assistance in developing manipulator-assisted UAV launch and recovery solutions, including end-effector design and motion planning algorithms.

PUBLICATIONS

Journal Articles

- 2025 Y. Sun, R. Xu, **Z. Jiang**, Y. Xian, Z. Chen, H. C. Yip, P. W. Y. Chiu, and Z. Li, “A Novel Wireless Magnetic Master Device for Six-DoF Robotic Teleoperation Control with Expandable Workspace,” *IEEE Transactions on Automation Sciences and Engineering*, early access, doi: [10.1109/TASE.2025.3628650](https://doi.org/10.1109/TASE.2025.3628650).
- 2025 L. Lei*, Y. Hu*, **Z. Jiang***, J. Miao, X. Luo, Y. Zhang, Q. Wang, S. Wang, Z. Li, and P.-A. Heng, “Towards Lung Ultrasound Automation: Fully Autonomous Robotic Longitudinal and Transverse Scans Along Intercostal Spaces,” *IEEE Transactions on Medical Robotics and Bionics*, vol. 7, no. 2, pp. 768–781, doi: [10.1109/TMRB.2025.3550663](https://doi.org/10.1109/TMRB.2025.3550663) (* indicates co-first authors).
- 2024 R. Xu, **Z. Jiang**, B. Liu, Y. Wang, and H. Qian, “Confidence-Aware Object Capture for a Manipulator Subject to Floating-Base Disturbances,” *IEEE Transactions on Robotics*, vol. 40, pp. 4396–4413, doi: [10.1109/TRO.2024.3463476](https://doi.org/10.1109/TRO.2024.3463476).

Conference Proceedings

- 2025 X. Luo, **Z. Jiang**, M. C. Lei, Y. Xian, Y. Hu, A. Dong, P. K. F. Chiu, Y.-H. Liu, and Z. Li, “Design and Geometry-Aware Planning of a Novel Probe-Scanning Manipulator with RCM Constraint,” *2025 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Hangzhou, China, in press (**Best Paper Award Finalist**).
- 2023 Y. Jiang, R. Xu, **Z. Jiang** and H. Qian, “Design, Modeling and Control of A Novel USV-Manipulator System,” *2023 IEEE International Conference on Real-time Computing and Robotics*, Datong, China, pp. 206–211, doi: [10.1109/RCAR58764.2023.10249802](https://doi.org/10.1109/RCAR58764.2023.10249802).
- 2022 C. Liu, **Z. Jiang**, R. Xu, X. Ji, L. Zhang and H. Qian, “Design and Optimization of a Magnetic Catcher for UAV Landing on Disturbed Aquatic Surface Platforms,” *2022 IEEE International Conference on Robotics and Automation*, Philadelphia, PA, USA, pp. 1162–1168, doi: [10.1109/ICRA46639.2022.9812270](https://doi.org/10.1109/ICRA46639.2022.9812270).

Patents

- 2024 C. Liu, Z. Cao, **Z. Jiang**, R. Xu, X. Ji, and H. Qian, *Unmanned Aerial Vehicle Landing System, Landing Method and Storage Medium*, Chinese patent [CN115167522B](#).
- 2023 **Z. Jiang**, X. Ji, C. Liu, and H. Qian, *Four-wing Flapping Wing Micro Water Surface Aircraft and Flight Method*, Chinese patent [CN114889821B](#).
- 2022 X. Ji, Z. Song, **Z. Jiang**, and H. Qian, *Flapping Wing Mechanism and Miniature Water Surface Flapping Wing Aircraft*, Chinese patent [CN217320745U](#).
- 2022 X. Ji, Z. Song, **Z. Jiang**, and H. Qian, *Flapping Wing Mechanism based on Double Cranks and Micro Water Surface Flapping Wing Aircraft*, Chinese patent [CN217320744U](#).

CONFERENCE ACTIVITY

Conference Presentation

Presenting author *italicized* if other than first author.

- 2024 **Z. Jiang**, Y. Hu, X. Luo, J. Miao, Y. Zhang, L. Lei, S. Wang, P.-A. Heng, and Z. Li, “A Collaborative Robotic System with In-Plane Orientation Adjustment for Lung Ultrasonography,” presented at ICRA 2024 workshop *Autonomy in Robotic Surgery: State of the art, technical and regulatory challenges for clinical application*, Yokohama, Japan, May 13.

AWARDS AND HONORS

- 2025 China International College Students’ Innovation Competition 2025
Gold Award, Team: *Magnetic Retraction System for Endoscopic Submucosal Dissection*.
- 2025 Prof. Charles K. Kao Student Creativity Awards, CUHK
Finalist, Team: *A Novel Robotic System for Minimally Invasive Transperineal Prostate Biopsy with Enhanced Safety*.
- 2024 The 14th “Challenge Cup” Qin Chuang Yuan National College Students’ Entrepreneurship Competition, China
Bronze Award, Team: *ColoMAG: A Magnet-Assisted System for Colorectal Cancer Screening and Early Surgical Treatment*.
- 2023 School of Science and Engineering Academic Year 2022–23 Dean’s List Award, CUHK-Shenzhen
- 2021–22 The 17–19th rounds of Undergraduate Research Award, CUHK-Shenzhen
Project: *Bio-Inspired Robot for Aquatic-Aerial Hybrid Locomotion*.
- 2020 RoboCom Robot Developer Competition (southern China regional)
Second Prize, semi-autonomous palletizing competition;
Third Prize, semi-autonomous palletizing time trial;
Third Prize, autonomous palletizing competition;
CUHK-Shenzhen representative team.

EXTRACURRICULAR ACTIVITY

- 2020–22 President, Student Robotics Association, CUHK-Shenzhen

SERVICE

Academic Journal Peer Review

IEEE Robotics and Automation Letters

Conference Peer Review

IEEE International Conference on Robotics and Automation

IEEE/RSJ International Conference on Intelligent Robots and Systems

IEEE International Conference on Robotics and Biomimetics

COURSE TAUGHT

BMEG5750 Medical Robotics, CUHK (Teaching Assistant)

OPEN SOURCE CONTRIBUTIONS

Maintainer

[minimal_handeye_ros2](#)  : A minimal ROS2 node for calculating the hand-eye calibration problem.

[ndi_ros2_driver](#)  : ROS2-control integration for Northern Digital Inc. (NDI) electromagnetic tracking and optical navigation systems.

Contributor

[cartesian_controllers](#)  : A set of Cartesian controllers for the ROS1 and ROS2-control framework.

[PLUS \(Public software Library for UltraSound\) Toolkit](#)  : Open-source toolkit for data acquisition, pre-processing, and calibration for navigated image-guided interventions.

SKILLS

Programming Languages: Python, C++, C, MATLAB

Software: ROS, SolidWorks, OpenCV, Open3D, MuJoCo, SOFA, 3D Slicer, LATEX, and more

Hardware: Experience with robotic arms (Universal Robots UR5, Franka Emika Panda, Interbotix WidowX-250), microcontrollers (Arduino, STM32, ESP32), single-board computers (Raspberry Pi), and diverse sensors (RGB-D cameras, ultrasound, optical, force/torque, haptic, magnetic field, etc.)

Languages: Chinese (native), English (fluent)

REFERENCES

Prof. LI Zheng  zhengli@cuhk.edu.hk

Professor

Department of Surgery

The Chinese University of Hong Kong

M.Phil. Supervisor

Prof. QIAN Huihuan (Alex)  hhqian@cuhk.edu.cn

Associate Professor

School of Science and Engineering

The Chinese University of Hong Kong, Shenzhen

B.Eng. Final Year Project Supervisor

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