

JIALE WANG

Hong Kong University of Science and Technology (HKUST), Hong Kong, China
+852 62787871 | jwangiv@connect.ust.hk | [Personal Website](#) | [Google Scholar](#)

EDUCATION

Hong Kong University of Science and Technology (HKUST)

Hong Kong, China

Master of Philosophy (MPhil) in Electronic and Computer Engineering

September 2023 – July 2025 (expected)

- GPA: 4.0 / 4.3 (Excellent Performance, **straight A's**)
- Relevant coursework: MECH5950 Introduction to Microsystems: Technology and Devices (A+, this course includes microfabrication processes such as deposition, photolithography and etching), ELEC5640 Robot Manipulation (A), ELEC5900 Modern Engineering Research Methodologies (A)
- Teaching: teaching assistant in ELEC3200 System Modeling, Analysis and Control
- **Led** lab members to conduct animal testing

Beijing University of Posts and Telecommunications (BUPT, "Project 211" University in China)

Beijing, China

Bachelor of Engineering in Automation

September 2019 – July 2023

- Grade: 91.37 / 100 (Comprehensive ranking: **1 / 70**)
- Selected honors:
 - 07/2023, Beijing Outstanding Graduate (**Highest honor for graduates**)
 - 06/2023, Outstanding Undergraduate Thesis Award (**1 / 70 in department**)
 - 2019-2020 & 2020-2021, First-class Scholarship
 - 2019-2020 & 2020-2021, Outstanding Student
- Relevant coursework: Intelligent Robot System (II) (4.0/4.0, **highest** mark in department), Computer-controlled Simulation (3.97/4.0, **highest** mark in department), Machine Learning (3.93/4.0, **highest** mark in department)
- **Exchange programme:** University of Cambridge Online Research Assistant Programme (Excellent), Tunis University Belt and Road Exchange Programme
- Served as a class commissary responsible for activities organization and Head of Study Department in the BUPT Student Union
- Did **oral presentation** and participated in the Q&A session in *ICRA 2022*

PUBLICATIONS (PUBLISHED OR ACCEPTED)

1. **Jiale Wang**, Chenhao Yue, Gang Wang, et al., "Task Autonomous Medical Robot for Both Incision Stapling and Staples Removal," in *IEEE Robotics and Automation Letters*, published. (**Ranking: Q1, 6 / 130**) [[Paper](#)] [[Video](#)]
2. Hao Ren*, **Jiale Wang***, Liu Yang, et al., "A Portable Wireless Spirometer Device for Long-term Pulmonary Function Monitoring and Training," in *Biosensors and Bioelectronics*, accepted. (**Ranking: Q1, 3 / 152**)
3. **Jiale Wang**, Hao Ren, Liu Yang, et al., "Robotic Anchoring System with Two Locomotion Modes for Preoperative Localization of Colorectal Cancer," in *2024 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, accepted.
4. Jiyan Zhang, Yue Xue, **Jiale Wang**, and Yuan Qi, "A Parallelized Algorithm for Channel Estimation in mmWave Massive MIMO Communications," in *2022 IEEE International Conference on Computer and Communications (ICCC)*, published. [[Paper](#)]
5. Hao Ren*, **Jiale Wang***, et al., "A Portable Wireless Spirometer Device for Long-term Pulmonary Function Monitoring and Training," in *2024 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, accepted.
6. **Jiale Wang**, Chenhao Yue, et al., "Task Autonomous Medical Robot for Both Incision Stapling and Staples Removal," in *IEEE International Conference on Robotics and Automation (ICRA)*, published. (**Top conference**) [[Homepage](#)]
7. Tianyang Zhao, Rongrong Qian, Yaqi Wang, Songling Zhang, and **Jiale Wang**, "Flying Like Birds: Hierarchical-Egalitarian Switching Based Control Law for Multi-UAV Systems," in *2022 Chinese Control and Decision Conference (CCDC)*, published. [[Paper](#)]

8. Jiyan Zhang, Yue Xue, Yuan Qi, and **Jiale Wang**, "The APC algorithm of solving large-scale linear systems: A generalized analysis," in *2022 International Conference on Communications and Networking in China (Chinacom)*, published. [\[Paper\]](#)

PUBLICATIONS (UNDER REVIEW)

1. Xiong Yang, Hao Ren, Dong Guo, Zhengrong Ling, Tieshan Zhang, Gen Li, Yifeng Tang, Haoxiang Zhao, **Jiale Wang**, Hongyuan Chang, et al., "F³T: A soft tactile unit with 3D force and temperature mathematical decoupling ability for robots," in *Engineering*, under review. **(Ranking: Q1, 2 / 307)**

PATENTS

1. **Jiale Wang**, Han Li, and Baiquan Su. "Autonomous Electrosurgery Robot System." CN116616902A, 2023. **(Invention patent)** [\[EPO\]](#)
2. Yuan Qi, Rongrong Qian, Jiyan Zhang, Yue Xue, and **Jiale Wang**. "Method and Device for Sparse Signal Recovery." CN113904689A, 2022. **(Invention patent)** [\[EPO\]](#)

RESEARCH EXPERIENCE

Task Autonomous Medical Robot for Both Incision Stapling and Staples Removal	Project Leader
BUPT (Department of Automation)	March 2021 – May 2022
<ul style="list-style-type: none">• Designed the mechanical structure and fabricated the prototype of the medical robot system by 3D printing.• Analysed kinematics of the UR manipulator to control the position of the device tip accurately and programmed it using C# to automate the whole manipulating process.• Developed the electrical circuit of the robot's end-effector and took charge of its embedded programming.• Proposed a novel framework using OpenCV and binocular vision-based methods to detect incisions or staples and later designed a new algorithm for planning staples efficiently through mathematical methods.• Designed and conducted extensive experiments to evaluate the performance of this robot in the real world, then processed and analysed experimental data using MATLAB for the manuscript.• Wrote the manuscript by LaTeX, and my paper was accepted by IEEE RA-L and ICRA 2022.• Did oral presentation about this research and participated in the Q&A session in ICRA 2022.	
A Bioelectronic Portable Wireless Spirometer for Pulmonary Function Monitoring and Training	Project Co-Leader
HKUST (Department of Electronics & Computer Engineering)	July 2023 – Present
<ul style="list-style-type: none">• Designed a compact structure of spirometer and fabricated its prototype independently.• Fabricated the bio-inspired air flow sensor in the bioelectronic device. The novel design gives the sensor anisotropic sensitivity to resist disturbances caused by eddy currents or random air turbulence.• Implemented Bluetooth communication between the spirometer and the server.• Developed an interactive UI to encourage patients to engage in breathing training.• Simulated the bioelectronic device by Finite Element Analysis in COMSOL.• Wrote the manuscript by LaTeX, and my paper was accepted by Biosensors and Bioelectronics.	
Long-lasting Gastric Resident System for Controllable and Adjustable Drug Delivery	Project Leader
HKUST (Department of Electronics & Computer Engineering)	September 2023 – Present
<ul style="list-style-type: none">• Designed a compact structure with swallowable size for the tiny drug release module and fabricated it by SolidWorks and stereolithography 3D printing. Moreover, I developed a miniature structure in this module to solve the problem of drug outlet pipe being blocked in the stomach.• Proposed a clever design in the drug storage module to ensure that system drug release rate is not affected by its pose change, and fabricated it based on a dip molding method.• Designed a power-efficient electronic system to enable the device to work well for 45 days, powered only by a 50mAh lithium battery.	

- Implemented **Wi-Fi communication** between the system and server through embedded programming. Users can remotely adjust the drug release plan on demand.
- Developed a **user-friendly UI** that allows users to control the system not only on mobile phones but on computers.
- Conducted **ex-vivo testing** in swine stomachs to validate the system's function, and used **Origin** to visualize the data.
- **Preparing the manuscript** for submission to a top journal in biomedical engineering.
- Collaborating with the University of Hong Kong to conduct **in vivo testing**.

Next-generation Capsule Robot for Both Diagnosis and Targeted Therapy

Project Co-Leader

HKUST (Department of Electronics & Computer Engineering)

September 2023 – Present

- Designed the robot structure and fabricated its prototype independently. Moreover, inspired by heart valves, I designed a waterproof mechanism to protect microneedles before contacting tissues.
- Proposed **the microneedles fabrication process** to ensure they have good forming quality.
- Improved **the materials of microneedles** to give them both high stiffness and biodegradability.
- Conducted **ex-vivo testing** and used **histological stained sections** to evaluate the effect of microneedle.
- **Preparing the manuscript** for submission to a top journal in robotics.

Other Projects

- Robotic Anchoring System with Two Locomotion Modes for Preoperative Localization of Colorectal Cancer:
Proposed a capsule robot system which can achieve two locomotion modes (slipping and flipping) in the stomach and anchor in the intestine for preoperative localization.

AWARDS AND HONORS

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| • First Prize in 10 th Beijing College Student Mechanical Innovative Design Competition (Team Leader)
(Highest prize in this competition, awarded to students with outstanding capabilities in mechanical design.) | 2020 |
| • Outstanding Entrepreneurial Team in Beijing College Student Entrepreneurial Team Selection
(Awarded to students with excellent capabilities in entrepreneurship.) | 2020 |
| • First Prize in 6 th Beijing College Student Engineering Design Competition (Individual Competition)
(Highest prize in this competition, awarded to students with rich experience in mechanical design.) | 2021 |
| • First Prize in 6 th Beijing College Student Engineering Design Competition (Team Competition)
(Highest prize in this competition, awarded to students with rich experience in mechanical design.) | 2021 |
| • Outstanding Winner in 9 th Beijing College Student Engineering Abilities Competition (Team Leader)
(Highest prize in this competition, awarded to students with excellent engineering abilities.) | 2021 |
| • National Level Award in the Innovation and Entrepreneurship Competition
(Highest prize in this competition, awarded to students with excellent innovation abilities.) | 2021 |
| • Excellent Conclusion in the Innovation and Entrepreneurship Competition
(Highest prize in this competition, awarded to students with excellent innovation abilities.) | 2021 |
| • National Level Award in the Innovation and Entrepreneurship Competition
(Highest prize in this competition, awarded to students with excellent innovation abilities.) | 2022 |
| • Second Prize in 11 th Beijing College Student Mechanical Innovative Design Competition
(Awarded to students with outstanding capabilities in mechanical design.) | 2022 |
| • Third Prize in the “Challenge Cup” Beijing College Students' Academic Science and Technology Contest
(Awarded to students with outstanding research performance.) | 2023 |

ADDITIONAL INFORMATION

- Programming Skills: Python, C++, C, MATLAB, PyTorch, LaTeX, Java, Linux, Git
- Specialized Software: SolidWorks, ANSYS, COMSOL, Altium Designer, Origin
- Language: Mandarin Chinese (native), English (TOEFL iBT 102 / 120) (GRE 320 / 340)