

# Yongjie HU

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Research Interests: Cable-Driven Parallel Robots (CDPRs) & Soft Grippers

## EDUCATION

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### Harbin Institute of Technology , Shenzhen, China

- School of Robotics and Advanced Manufacture

M.Eng. in Mechanical Engineering

Sept. 2023 – Expected Apr. 2026

- School of Mechanical Engineering and Automation

B.Eng. in Mechanical Design, Manufacturing, and Automation (GPA: 86.807/100)

Sept. 2019 – Jun. 2023

## PUBLICATION

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**Y. Hu, H. Liu and H. Yuan, "A Portable Cable-Suspended Parallel Robot and Its Applications in Indoor Inspection"**

in *IEEE Robotics and Automation Letters*, vol. 9, no. 11, pp. 10644-10651, Nov. 2024

## RESEARCH EXPERIENCES

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### Design, Modeling, and Control of Portable Cable-Driven Parallel Robots

*Individual research during the master's degree*

Sept. 2023 – Present

- Designed two integrated cable-driven parallel robots of different sizes and load capacities, featuring all necessary hardware embedded on the moving platform;
- Established a kinetostatic (kinematics-statics coupled) model of underactuated cable-driven parallel robots;
- Proposed an oscillation suppression method based on reaction wheels for underactuated cable-driven parallel robots;
- Proposed a self-calibration method that does not require external measuring devices, such as a laser tracker;
- Developed a hardware control system based on STM32F4 and a host computer software using Qt;

### Research on Microgravity Environment Simulation System using Cable-Driven Parallel Robots

*Participant in a collaborative project with an institute of aerospace research*

Oct. 2024 – May. 2025

- Designed movable cable-driving modules for the microgravity cable-driven experimental platform;
- Investigated a gravity compensation method using an eight-cable configuration;
- Conducted experiments on the motion of space robots in the simulated microgravity environment.

### Variable Stiffness Fin Ray Gripper for Extreme Environments

*Participant responsible for the mechanical design and experimental validation*

May. 2024 – Aug. 2024

- Designed a variable stiffness fin ray gripper using springs as flexible components, capable of operating in extreme environmental conditions such as extremely high or low temperatures and chemically aggressive environments;
- Measured multiple stiffness of the designed fin ray finger;
- Conducted flexible grasping experiments on objects of various shapes.

### Autonomous Vision-based Robotic Grasping System

*Participant responsible for control system integration*

Nov. 2024 – Dec. 2024

- Set up communication between the host computer and UR5 robotic arm via TCP/IP;
- Integrated visual detection, robotic arm control, and gripper operation;
- Developed a workflow for autonomous vision-based robotic grasping.

## AWARDS

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- National First Prize** in RoboMaster University Championship, 2021
- National First Prize** in College Student's Innovation Competition of Advanced Drawing Technology, 2021
- National Second Prize** in National College Student's Competition of Mechanical Product Digital Design, 2020
- First Prize** in the university's annual Freshman Project Competition
- Outstanding Graduate of Harbin Institute of Technology (Shenzhen)

## SKILLS

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- Proficient in the mechanical design of robots using SolidWorks and AutoCAD
- Familiar with robotic modeling and simulation using MATLAB
- Familiar with STM32-based development for robot control and Qt-based development for host-side software
- Skilled in academic writing and effective communication in English (CET-6: 554)