

Yongjie HU

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

EDUCATION

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

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

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;
- Carried out experimental validation of the proposed model and method on a prototype.

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

- First Prize** in RoboMaster University Championship, 2021
- First Prize** in National College Student's Innovation Competition of Advanced Drawing Technology, 2021
- Outstanding Graduate of Harbin Institute of Technology (Shenzhen)

SKILLS

- Proficient in the mechanical design of robots using SolidWorks and AutoCAD;
- Familiar with robotic modeling and simulation using MATLAB;
- Familiar with the manufacturing technologies such as 3D printing, CNC, and laser cutting;
- 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).