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 (GPA: 3.331/4.0) *Sept. 2023 – Expected Apr. 2026*
- School of Mechanical Engineering and Automation
  B.Eng. in Mechanical Design, Manufacturing, and Automation (GPA: 85.365/100) *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.

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, preparing for IELTS).