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Mingshan He

EDUCATION

Seoul National University *Sept. 2022 - July. 2024(expected)*
M.S. in Mechanical and Aerospace Engineering *Seoul, Korea*
Advised by Dr. Kyujin Cho, GPA:90.7/100
Core Modules: ***Control System***, ***Robotic Mechanism***, ***Continuum Mechanism***, ***Biologically Inspired Robotics***, ***Design of Medical Robots and Devices***, *Convex Optimization, Differential Equation, Robot Actuation and Sensing Mechanism, Sensor-based Spatial Intelligence, Humanoid Robot Theory, AI Hardware Design and Project*

Northeastern University *Sept. 2017 - July. 2021*
B.S. in Robotic Engineering, GPA:84.24/100 (Rank: 15/64) *Shenyang, China*
Core Modules: *Robotics Foundations, Robot Dynamic Control, Machine Learning, Principle of Automatic Control, Computer Control System, Analog and Digital Electronic Circuits*

VISITING EXPERIENCE

Smart Sensing and Robotics Group (SSR) *Jun. 2022 - Aug. 2022*
Advised by Prof. Wenbo Ding *Tsinghua University, ShenZhen(China)*

Autonomous Robot Group *Aug. 2021 - Feb. 2022*
Advised by Prof. Yuqing He *Chinese Academy of Sciences, Shenyang(China)*

Big Data and Industrial Intelligence Technology Laboratory *Jun. 2021 - Aug. 2021*
Advised by Engineer Bing Han *Beihang University, Hangzhou(China)*

SELECTED PUBLICATIONS

International Conference Proceedings

1. Shoujie Li Mingshan He Wenbo Ding Linqi Ye Xueqian Wang Junbo Tan Jinqiu Yuan and Xiao-Ping Zhang. Visuotactile sensor enabled pneumatic device towards compliant oropharyngeal swab sampling. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, Detroit, Oct. 2023. Best Application Paper Award–Finalist

Patents

1. Experimental device for teaching mechanical engineering 2018

RESEARCH EXPERIENCE

Electro-Adhesive Crawling Robot 2023 - Now
Undergraduate Reserach Program Research Topic *BioRobotics LAB, SRRC*

· Using HASEL Actuator integrated with Electro Adhesive Module to make the climbing robot.
· Key Words: Electro-Adhesive, HASEL Actuator, Climbing Robot

Multi Objects Gripper System Development 2022 - Now
Research Topic *BioRobotics LAB, SRRC*

· Develop the underactuated soft gripper of 3 fingers with 1 motor driven and design its control sytem to simulating in the Isaac Sim. Then create optimized strategy to grasp multi-objects.
· Key Words: Underactuated, Tendon Driven, Multi-Object Grasping, Isaac Sim

Robot Control System Development 2021 - 2022
Research Assistant *State Key Laboratory of Synthetical Automation for Process Industries*

· Learned the communication between Low-level servo drivers and host computer in Ethercat and CAN.
· Self defined and tested ros controllers in 'ros control' framework.

Dual-Mode Teleoperation with Variable Admittance Control 2020-2021
Undergraduate Student Research Assistant *NEU Human Robot Collaborate Lab*

- Designed and developed an innovative teleoperating framework with 2 IMU sensors and a robotic arm manipulator.
- Researched control algorithms for a robotic arm manipulator with variable admittance control.

Multi-mode Control Technologies of Exoskeleton Robot Undergraduate Thesis
Undergraduate Student Research Assistant *NEU Human Robot Collaborate Lab*

- Developed robot hardware interface module with ROS2 Framework in real-time control.
- Designed and developed the compliant control algorithm on this robot to enhance the human machine collaboration ability.
- GitHub: NEU-Exoskeleton.

SERVICES

Chinese Association of Automation 2021-present

- Member Beijing,China

AWARDS AND HONORS

2022 "Master Candidate", Korean Global Scholarship & China Scholarship Council (CSC)
2021 "Best Individual", Cambridge University Winter Camp
2021 "Best Group", Cambridge University Winter Camp
2021 "First Class Scholarship", Northeastern University
2020 "First Prize", National Robot Competition
2020 "First Prize", National Marine Vehicle Design and Manufacture Competition
2020 "Meritorious Winner", Mathematical Contest in Modeling(MCM/ICM)
2020 "First Class Scholarship", Northeastern University
2019 "Third Prize", The Chinese Mathematics Competitions
2019 "First Class Scholarship", Northeastern University
2018 "First Class Scholarship", Northeastern University
2017 "Third Prize", The 33th Chinese Physics Olympiad

LANGUAGES & SKILLS

- Chinese (native), Korean (native), English (fluent)
- Programming Languages: MATLAB, C/C++, Python, Verilog, HTML
- Robotic softwares (**ROS**, **SOFA**, Coppeliasim, MuJoCo), CAD/CAE softwares (**SolidWorks**, Auto CAD), PCB software (**Altium Design**), OpenCV, Docker, MicroControl Chips(STM32, Ardunio)
- LaTeX, Microsoft Office, Ubuntu, MAC, Windows

FIELD OF INTEREST

Robotics Modelling, Robotic perception, Compliant and Optimal Control.

TEACHING & ADVISING

[A047619] Mobile Robot Control Experiment *Spring 2022*
Undergraduate Elective Major *Teaching Assistant*

Undergraduate Thesis Program
Chair / Co-chair

- Boyang Zhang (B.Eng. in Robotics Engineering, Northeastern University) 2022
- Yixin Liu (B.Eng in Computer Sceince and Engineering, Korea University) 2023
- HyunJun Jeon (B.Eng in Mechanical Engineering, Korea University) 2024