Honghao Lv

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State Key Laboratory of Fluid Power and Mechatronic Systems
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EDUCATION

- Feb. 2018−Jun. 2023 (expected):
  Doctoral Candidate in Mechatronic Engineering, School of Mechanical Engineering, Zhejiang University (ZJU), Hangzhou, China
- Dec. 2021− Dec. 2022:
  Guest Researcher (Traineeship Ph.D.) in Communication & Robotics Lab, ABB AB, Corporate Research Center, Västerås, Sweden
- Sep. 2021− Dec. 2022:
  Visiting Ph.D. Student in Information Technology and Robotics, Division of Information Science and Engineering, EECS, KTH Royal Institute of Technology, Stockholm, Sweden
- May 2018: Training Programme of Simulation in RobotStudio, ABB Engineering Ltd., Shanghai, China
- Sep. 2014−Jun. 2018:
  B. Eng. in Mechanical Engineering, School of Mechatronic Engineering, China University of Mining and Technology (CUMT), Xuzhou, China
  Academic Achievement: average score 91.2(100), GPA 3.88(4), rank 2/339
- Computer Skills: Python, C++, MATLAB, RAPID (ABB), ROS, RobotStudio, OpenCV, NCRE Rank II (Visual Basic), NCRE Rank III (Internet Technology)

SPECIALTY

- Dual-arm Robotic Teleoperation & Human-Robot Collaboration
- Human-Robot Intelligent Interface & Safe Interaction
- Artificial Intelligence and its Applications in Robotics
- Mobile Robot and Multi-Robot Coordination

PUBLICATION LIST

- Journal Papers:
  [1] **Honghao Lv**, Zhibo Pang*, Koushik Bhimavarapu, and Geng Yang, “Impacts of Wireless on Robot Control: The Network Hardware-in-the-Loop Simulation Framework and Real-Life Comparisons”, IEEE Transactions on Industrial Informatics (IEEE TII), IF: 11.648, DOI:10.1109/TII.2022.3227639, Dec. 2022. (**1 区, TOP**)
  [2] **Honghao Lv**, Depeng Kong, Gaoyang Pang, Baicun Wang, Zhangwei Yu, Zhibo Pang, and Geng Yang*, “GuLiM: A Hybrid Motion Mapping Technique for Teleoperation of Medical Assistive Robot in Combating the COVID-19 Pandemic,” IEEE Transactions on Medical Robotics and Bionics (IEEE TMRB), vol. 4, no. 1, pp. 106−117, Jan. 2022. DOI: 10.1109/TMRB.2022.3146621 **(Popular Article)**
  [3] **Honghao Lv**, Geng Yang*, Huiying Zhou, Xiaoyan Huang, Huayong Yang, Zhibo Pang, “IoT-enabled Dual-arm Motion Capture and Mapping for Telerobotics in Home Care,” IEEE Journal of Translational Engineering in Health and Medicine (IEEE JTEHM), IF: 2.075, Jun. 2020. DOI: 10.1109/JTEHM.2020.3002384.
  [4] Geng Yang*, **Honghao Lv**, Zhiyu Zhang, Liu Yang, Siqi You, Juan Du, Huayong Yang, “Keep Healthcare Workers Safe: Application of Teleoperated Robot in Isolation Ward for COVID-19 Prevention and Control” Chinese Journal of Mechanical Engineering (CJME), IF: 1.413, vol. 33, no. 47, Jun. 2020. DOI: 10.1186/s10033-020-00464-0. **(1st author is my supervisor, 2020 Highly-Cited CJME Articles TOP1, the Outstanding Papers of CAST in 2022, 第七届中国科协优秀科技论文)**
  [5] Ruohan Wang†, **Honghao Lv**†, Zhangli Lu, Xiaoyan Huang, Haiteng Wu, Junjie Xiong, Geng Yang*, “A medical assistive robot for tele-healthcare during the COVID-19 pandemic: development and usability study in an isolation ward” JMIR Human Factors, (Preprint), DOI:10.2196/42870, Jan. 2023. **(Co-first author)**

[6] Huiying Zhou, Geng Yang*, **Honghao Lv**, Zhibo Pang, Xiaoyan Huang, Huayong Yang, "IoT-enabled Dual-arm Motion Capture and Mapping for Telerobotics in Homecare" IEEE Journal of Biomedical and Health Informatics (IEEE JBHI), 2019.

[7] Geng Yang, **Honghao Lv**, Feiyu Chen, Zhibo Pang, Jin Wang, Huayong Yang, Junhui Zhang*, "A Novel Gesture Recognition System for Intelligent Interaction with a Nursing-Care Assistant Robot" Applied Sciences-Basel, IF:2.217, vol. 8, (12), art. no. 2349, Dec. 2018. DOI: 10.3390/app8122349. **(1st author is my supervisor)**

[8] Feiyu Chen, **Honghao Lv**, Zhibo Pang, Junhui Zhang, Yonghong Hou, Ying Gu, Huayong Yang and Geng Yang*, "WristCam: A Wearable Sensor for Hand Trajectory Gesture Recognition and Intelligent Human-Robot Interaction" IEEE Sensors Journal. IF: 3.076, pp. 1-1, Oct. 2018. DOI: 10.1109/JSEN. **(project leader)**

[9] Depeng Kong, Geng Yang*, Gaoyang Pang, Zhiqiu Ye, **Honghao Lv**, Zhangwei Yu, Fei Wang, Xi Vincent Wang, Kaichen Xu, and Huayong Yang, "Bioinspired Co-Design of Tactile Sensor and Deep Learning Algorithm for Human-Robot Interaction," Advanced Intelligent Systems, vol. 4, no. 6, DOI: 10.1002/aisy.202200050, Jun. 2022. **(build the verification platform)**

[10] Zakka Vincent Gbouna†, Gaoyang Pang†, Geng Yang*, Zeyang Hou, **Honghao Lv**, Zhangwei Yu, and Zhibo Pang, "User-Interactive Robot Skin with Large-Area Scalability for Safer and Natural Human-Robot Collaboration in Future Telehealthcare," IEEE Journal of Biomedical and Health Informatics, IF:5.772. DOI: 10.1109/JBHI.2021.3082563, May 2021 **(build the verification platform)**

[11] Wenzheng Heng, Geng Yang, Gaoyang Pang, Zhiqiu Ye, **Honghao Lv**, Juan Du, Guodong Zhao, and Zhibo Pang, "Fluid-Driven Soft CoboSkin for Safer Human-Robot Collaboration: Fabrication and Adaptation," Advanced Intelligent Systems, Jun. 2020. DOI: 10.1002/aisy.202000038. **(build the verification platform)**

[12] Zhiqiu Ye†, Gaoyang Pang†, Kaichen Xu, Zeyang Hou, **Honghao Lv**, Yiren Shen, and Geng Yang*, "Soft Robot Skin with Conformal Adaptability for On-body Tactile Perception of Collaborative Robots," IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 5127-5134, DOI: 10.1109/LRA.2022.3155225, Apr. 2022. **(build the verification platform)**

◆ Conference Papers (peer-reviewed):

[1] **Honghao Lv**, Zhibo Pang, Geng Yang, "Hardware-in-the-Loop Simulation for Evaluating Communication Impacts on the Wireless-Network-Controlled Robots", in the 48th Annual Conference of the IEEE Industrial Electronics Society (IECON 2022), Brussels, Belgium, 17-20 October. 2022. **(IEEE IES Students & Young Professionals Paper Award)**

[2] Ruibin Zhang, **Honghao Lv**, Huiying Zhou, Yurui Zhang, Chenhao Liu, and Geng Yang*, "A Gait Recognition System for Interaction with a Homecare Mobile Robot", in the 46th Annual Conference of the IEEE Industrial Electronics Society (IECON 2020), Singapore, 16-20 October. 2020. **(project leader)**

[3] Yuqi Wang, **Honghao Lv**, Huiying Zhou, Qi Cao, Zikang Li, and Geng Yang*, "A Sensor Glove Based on Inertial Measurement Unit for Robot Teleoperetion", in the 46th Annual Conference of the IEEE Industrial Electronics Society (IECON 2020), Singapore, 16-20 October. 2020. **(project leader)**

[4] Huiying zhou†, **Honghao Lv**†, Kang Yi, Zhibo Pang, Huayong Yang, Geng Yang*, "An IoT-Enabled Telerobotic-Assisted Healthcare System Based on Inertial Motion Capture" in the 2019 IEEE International Conference on Industrial Informatics (INDIN 2019), Helsinki, 22-25 Jul., 2019. **(co-first author)**

[5] Shimin Pan, **Honghao Lv**, Hong Duan, Gaoyang Pang, Kang Yi, and Geng Yang*, "A Sensor Glove for the Interaction with a Nursing-Care Assistive Robot", in the 2019 IEEE International Conference on Industrial Cyber-Physical Systems (ICPS 2019), Taipei, 6-9 May, 2019. **(project leader)**

[6] Huiying Zhou, Liu Yang, **Honghao Lv**, Kang Yi, Huayong Yang, and Geng Yang*, "Development of a Synchronized Human-Robot-Virtuality Interaction System using Cooperative Robot and Motion Capture Device", in the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2019), Hongkong, 8-12 Jul., 2019. **(build the verification platform)**

◆ Patents:

[1] Yang Geng, **Lv Honghao**, Pang Gaoyang, Yang Huayong, Zhejiang University; A Dirigible Dual-arm Omnidirectional Mobile Nursing-care Robot: ZL. 2018 1 0534638.1 [P]. 2018-10-26. (Granted) **(1st author is my supervisor)**

[2] Yang Geng, **Lv Honghao**, Zhang Zhiyu, Yang Huayong, Zhejiang University; A Software for Acquisition and Analysis of Dual-arm Robot's motion Status: Registration No.2020SR0061078. **(1st author is my supervisor)**

[3] Yang Geng, **Lv Honghao**, Wang Ruohan, Yang Huayong, Zhejiang University; A Human Motion Capture and Guidance Data Generation Software for Dual-arm robot teleoperation: Registration No.2022SR0816120. **(1st author is my supervisor)**

[4] Yang Geng, Li Le, **Lv Honghao**, Yang Huayong, Zhejiang University; A Software for Controlling and Monitoring the Robot Torso Motion Status: Registration No.2022SR0816145.

[5] **Lv Honghao**, Hao Jingbin, Jia Kun, China University of Mining and Technology; A Smart Home System Based on LabView and TCP/IP Network Protocol: CN201721694857.3[P]. 2017-12-07. (Utility model)

[6] Ding Haigang, **Lv Honghao**, Cheng Gang, Zhao Jiyun, Cao Chao, China University of Mining and Technology; A Speed Measuring Device for Large Diameter Rotating Shaft without Protruding End.: CN201711391943.1[P]. 2017-12-21. (Invention publication) **(build the verification platform)**

RESEARCH PROJECTS

- Preparatory research Supported by a Research Project * 2021:
  Project Leader *Research on impedance control and digital twin modeling for dual-arm mobile robot, using* **Kinova Gen2** Ultra *Robot*
- Preparatory research Supported by a Research Project * 2020:
  Project Leader *Research on teleoperation technology for dual-arm special robot, using* **Kinova Gen2** Ultra *Robot*
- Zhejiang University Special Scientific Research Fund for COVID−19 Prevention and Control (Grant No. 2020XGZX017) 2020:
  Project Leader *Application of Tele-Robotic Technology for Auxiliary Diagnosis and Treatment of COVID−19 in Isolation Ward, using* **YuMi** *Robot*
- Robotics Institute of Zhejiang University (Grant No. K18-508116-008-03) 2019:
  Project Leader *Human-robot Collaborative Assembly Based on Target Recognition Using Kinect and Security Interaction Design, using* **YuMi** *Robot*
- Robotics Institute of Zhejiang University (Grant No. K18-508116-008-03) 2018:
  Project Leader *Cooperative Control System of Dual-Arm Robot Based on Human Action Recognition, using* **YuMi** *Robot*

FUNDED PROJECTS I'M INVOLVED IN

- Feb. 2020–Aug. 2020, "*Application of intelligent robot technology in assistive diagnosis and treatment of COVID-19 isolation ward and in promotion of patients' mental health.*" Supported by the Zhejiang University Special Scientific Research Fund for COVID-19 Prevention and Control, Grant No. 2020XGZX017, Project Investigator: Prof. G. Yang (PI), J. Du, H. Wang, J. Su, J. Wang, Y. Sun, **H. Lv**, Z. Ye, D. Kong, G. Pang, J. Deng, H. Zhou, L. Yang, Z. Zhang, Z. Hou, and Z. Li. (CNY 500,000)
- Jan. 2020–Dec. 2023, "*Research on emotional recognition and behavioral interaction method of safety-oriented two-arm cooperative robots for senior citizens.*" Supported by the National Natural Science Foundation of China, Grant No. 51975513, Project Investigator: Prof. G. Yang (PI), **H. Lv**, G. Pang, J. Deng, H. Zhou, L. Yang, Z. Zhang, W. Sun, and T. Qiu. (CNY 600,000) (Indexed by NSFC ISIS)
- Jan. 2020–Dec. 2023, "*Research on multimodal soft sensing and natural human-robot cognitive interaction for collaborative robots.*" Supported by the Zhejiang Provincial Natural Science Foundation of China, Grant No. LR20E050003, Project Investigator: Prof. G. Yang (PI), **H. Lv**, G. Pang, J. Deng, H. Zhou, L. Yang, and Z. Zhang. (CNY 800,000)
- Apr. 2020−Apr. 2024, "*Research on cooperative teleoperation of dual arm robot based on inertial motion capture.*" Supported by Open Foundation of the State Key Laboratory of Fluid Power and Mechatronic Systems, The State Key Laboratory of Fluid Power and Mechatronic Systems, Grant No. SKLoFP_ZZ_2002, Project Investigator: Prof. G. Yang (PI), **H. Lv**, Z. Ye, D. Kong, H. Zhou, L. Yang, Z. Zhang, Z. Hou, and Z. Li. (CNY 600,000)

AWARDS & SCHOLARSHIPS

- IEEE Students & Young Professionals Paper Assistance Award Oct. 2022
- Scholarship under China Scholarship Council (CSC) for Joint PhD Student Jun. 2021
- National Scholarship (for Doctoral Candidate) Nov. 2020
- ZJU Innovation and Entrepreneurship Individual Award Nov. 2020
- Gold Prize, National Machinery Industry Design Innovation Contest Nov. 2021

- Gold Prize, International College Students' "Internet+" Innovation and Entrepreneurship Competition of Zhejiang Province — Aug. 2020
- 2nd Prize in China Postgraduate Robot Innovation and Design Competition — Sep. 2022
- 3rd Prize in China Postgraduate Robot Innovation and Design Competition — Sep. 2020
- 1st Prize in Robot Innovative Design Competition of ZJU — Jun. 2020
- 2nd Prize, ChapHoyea Scholarship of ZJU — Dec. 2019
- 2nd Prize in Robot Innovative Design Competition of ZJU — Jun. 2019
- Excellent Graduation Project of CUMT — Jun. 2018
- National Scholarship (for Undergraduate Student) — Nov. 2017
- National Scholarship (for Undergraduate Student) — Nov. 2016
- National Scholarship (for Undergraduate Student) — Nov. 2015
- 2nd prize, China Undergraduate Mathematical Contest in Modeling — Sep. 2015
- 3rd prize, Virtual Instrument Contest of Jiangsu Province — Oct. 2016
- 3rd prize, Mathematical Modeling Contest of Jiangsu Province — May 2016
- 1st prize, Curriculum Design of Machine Design Contest — Mar. 2017

HONORS & MISCELLANEOUS

- TOP10 Student of ZJU ME — 2021
- Merit Graduate Student of ZJU — 2019, 2020
- Excellent Graduate Student of ZJU — 2019, 2020
- Sun-Yueqi Outstanding Student Award — 2018
- Outstanding Graduates of CUMT — 2018
- Merit Student of Jiangsu Province — 2018
- Outstanding Student Cadre of Shandong Province — 2014
- Merit Student of Zibo City — 2011
- Excellent Individual in Military Training — 2014
- Vice president of Party Workstation — 2017
- Excellent Student Cadre and League Member of CUMT — 2015, 2016, 2017
- Excellent volunteer of Xuzhou Central Hospital — 2015

RESEARCH EXPERIENCE in CUMT

- **Project Leader** — Apr. 2016−Dec. 2016
  Participated in Training Program of Innovation for Undergraduates with the project called *the development of a portable friction coefficient tester*; Built a prototype which has been tested successfully; In charge of designing the hardware circuit and programming the whole LabVIEW codes.
- Participant — Jul. 2016−Jun. 2018
  Took part in the project called *the development of intelligent home based on face recognition and voice control*; Obtained the 3rd prize in the Virtual Instrument Contest of Jiangsu Province; In charge of assembling and debugging of the hardware.
- Participant — Apr. 2017−Jun. 2018
  Involved in the project named *the design of robot key parts based on the 3D printing*; In charge of modeling and analyzing the 3D models.