

Hao Hu

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Education & Experience

- **Zhejiang University** Hangzhou, China
M.S. in Mechanical Engineering, The State Key Laboratory of Mechatronic Systems Sep. 2021 – Present
Ranking: 1/45
- **Zhejiang University/University of Illinois Urbana-Champaign** Haining, China
B.S. in Mechanical Engineering, ZJU-UIUC joint undergraduate program (ZJUI) Sep. 2017 – Jun. 2021
Overall GPA: 3.78/4.0 (94.5/100)
- **University of Illinois at Urbana-Champaign Institute** IL, USA
Exchange student in Mechanical Engineering Jan. 2020 – Jun. 2020
- **Imperial College London** London, UK
Winter School, Data Science Institute Feb. 2019
– Obtained credits and hand-on experience on machine learning and neural network

Publications & Patents of Invention

- **Publications:**
 - [1] **Hao Hu**, Chengqian Zhang, Chenfeng Pan, etc. 2022. Wireless Flexible Magnetic Tactile Sensor with Super-Resolution in Large-Areas, **ACS Nano** **16,11 (2022): 19271-19280**
 - [2] **Hao Hu**, Chengqian Zhang, Xinyi Lai, etc. 2024. Large-area Magnetic Skin for Multi-point and Multi-scale Tactile Sensing with Super-resolution, **npj Flex Electron** **8, 42 (2024)**
 - [3] Daofan Tang, Chengqian Zhang, Chenfeng Pan, **Hao Hu**, etc. 2024. Bistable soft jumper capable of fast response and high take-off velocity, **Science Robotics**, **9, eadm8484(2024)**.
 - [4] Huangzhe Dai, Chengqian Zhang, **Hao Hu**, etc. 2024. Biomimetic Hydrodynamic Sensor with Whisker Array Architecture and Multidirectional Perception Ability, **Advanced Science**, **(2024): 202405276**
 - [5] Huangzhe Dai, Chengqian Zhang, Chenfeng Pan, **Hao Hu**, etc. 2023. Split-Type Magnetic Soft Tactile Sensor with 3D Force Decoupling, **Advanced Materials**, **(2023): 2310145**
 - [6] Xuechun Zhang, **Hao Hu**, Daofan Tang, Chengqian Zhang, Jianzhong Fu and Peng Zhao, 2021. Magnetic flexible tactile sensor via direct ink writing, **Sensors and Actuators A: Physical** **327 (2021): 112753**
- **Patents of Invention:**
 - [1] Peng Zhao, **Hao Hu** etc. Folding magnetization method, tactile sensor structure and magnetic tactile sensor, China, ZL 2021 1 0390227.1
 - [2] Peng Zhao, **Hao Hu** etc. Magnetic flexible tactile sensing structure and application based on folding magnetization method, China, ZL 2021 1 0384615.9
 - [3] Peng Zhao, **Hao Hu** etc. Magnetic flexible tactile sensing structure and application based on folding magnetization method, USA, 17656036, in press

Projects & Research Experience

- **Wireless Flexible Magnetic Tactile Sensor with Super-Resolution** ZJU
Group leader, Advisor: Prof. Peng Zhao Sep. 2021 – Present
 - Designed special magnetic arrangement and machine learning algorithm to achieve super-resolution perception
 - Demonstrated the super-resolution perception and wireless transmission functions in future human-machine interaction and humanoid robot tactile perception
 - Led the teamwork and won the third prize at the national level and the first prize at Zhejiang University in 4th China Postgraduate Robot Innovation and Design Competition
- **PDMS Package Optimization for Flexible Electronics** ZJU
Research assistant, Advisor: Prof. Chengfeng Pan May. 2023 – July. 2023
 - Modified and assembled a PDMS extrusion 3D printer, and enabled the printer to achieve ideal encapsulation of flexible electronic devices
 - Adjusted the ratio of PDMS to nano-silica to achieve a material that can flow smoothly but is not overly liquid

- Mechanical Properties Changes of Hydrogels Under High Pressure** ZJU
 Research assistant, Advisor: Prof. Tiefeng Li Sep. 2022 – Feb. 2023
 - Optimized the preparation process of acrylic hydrogels in different proportions, and prepared the 30um thick hydrogel film using silica gel film die-casting process
 - The micron-sized sample was cut using femtosecond laser process and then placed in a high-pressure chamber. The tiny magnetic film was wirelessly manipulated by outside magnetic field coil to explore the mechanical changes of the hydrogel under high pressure
- Magnetic Flexible Tactile Sensor via Direct Ink Writing** ZJU
 Research assistant, Advisor: Prof. Peng Zhao Jun. 2018 – Sep. 2020
 - Built the DIW 3D printing and magnetization platform for fabricating magnetic elastomers
 - Compiled the G-code algorithm to print the negative Poisson's ratio structure magnetic elastomers
 - Conducted the real-time display experiment of magnetic plate with LED lights as a demo to show the wireless data transimission ability of the magnetic sensor
- Bidirectional Magnetic Projection** ZJU
 Research assistant, Advisor: Prof. Jianzhong Fu Sep. 2019 – Dec. 2019
 - Built the magnetic projection separates to separate mixed materials simultaneously in a container full of paramagnetic medium by sending the materials from the releasing position to their corresponding landing zones
- Direct Ink Writing 3D Printing of Silicone Elastomer Soft Robots** UIUC
 Research assistant, Advisor: Prof. E. T. Hsiao-Weckslar Feb. 2020 – Jun. 2020
 - Built a customized 3D printer for direct ink writing of elastomers
- Camera-based 3D Reconstruction for Physical Disabilities** ZJU
 Student Research Training Program, Advisor: Prof. Liangjing Yang Mar. 2019 – Mar. 2020
 - Developed a new method to generate medically significant wound models of the limbs of the disabled
 - Awarded the "Excellent Student Research Training Program"
- New Conceptual Electric Toothbrush** ZJU
Team Leader, Zhejiang University "Jie Chang Drive Cup" Innovation Competition Sep. 2018 – Dec. 2018
 - Designed an electric toothbrush that integrates both the toothpaste and toothbrush
 - Led the teamwork and won the **Best Creative Award** as the **only undergraduate team** and a grant from the Alibaba Geek Program

Honors & Awards

- Graduate Level:**
 - Chu Kochen Scholarship, the highest honor for ZJU students** Oct.2023
 - National Scholarship, Top 1%, MOE of China** Nov.2022
 - Award of Honor for Graduate, ZJU 2021 – 2022
 - Graduate of Merit/Triple A graduate, ZJU 2021 – 2022
 - Creativity of Entrepreneurship Scholarship, ZJU 2021 – 2022
 - The Third Prize in International College Students' 'Internet' Innovation and Entrepreneurship Competition 2021
 - The Third Prize at the national level at 4th China Postgraduate Robot Innovation and Design Competition 2021
 - The First Prize in Zhejiang University at 4th China Postgraduate Robot Innovation and Design Competition 2021
- Undergraduate Level:**
 - Outstanding Graduates of Zhejiang University Jun. 2021
 - Dean's List, UIUC 2020
 - Award of Honor for Graduate, ZJU 2020 – 2021
 - Innovation and Entrepreneurship Award, ZJU 2019 – 2020
 - Academic Progress Award, ZJU 2019 – 2020
 - Pacemaker in foreign exchange, ZJU 2018
 - The Sixth Prize in Rugby Competition, ZJU 2018
 - Top Ten Teams of Social Practice, ZJU 2018
 - Third-Class Academic Excellence Scholarship, **Top 10%**, ZJUI 2017 – 2018
 - Innovation and Entrepreneurship Award, ZJU 2017 – 2018
 - The Second Prize in the "White Horse Cup" Debate Competition, ZJUI 2017

Skills & Teaching & Service

Skills: 3D Printing (FDM,DIW), Python, Pytorch, SolidWorks, AutoCAD, MATLAB, OpenSim, Latex, TOEFL: 101

Teaching Assistant: ME170 Computer-Aided Design, Spring 2020; ME340 Dynamics of Mechanical Systems, Fall 2020