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. 2023. Large-area Magnetic Skin for Multi-point and Multi-scale Tactile Sensing with Super-resolution, **npj Flexible Electronics, under review**
  - **[3]** Huangzhe Dai, Chengqian Zhang, Chenfeng Pan, **Hao Hu**, etc. 2023. Split-Type Magnetic Soft Tactile Sensor with 3D Force Decoupling, **Advanced Materials, (2023): 2310145**
  - **[4]** 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**
  - **[5]** Daofan Tang, Chengqian Zhang, Chenfeng Pan, **Hao Hu**, etc. 2023. Bistable soft jumper capable of fast response and high take-off velocity, **Science Robotics, under review**

- **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-Wecksler 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, Top 0.04%, 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 Enterpreneurship 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