Huyue Chen

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RESEARCH INTERESTS

1. Physical Intelligence, Biomedical Micro-robotics.
2. Mechanical Metamaterials, Unconventional Computing.

EDUCATION

China Scholarship Council fellowship **Sept. 2023 – June 2025**

Shanghai Jiao Tong University, Shanghai, China (Ph. D student) **Sept. 2020 – Expected in 2025**

Design, manufacturing & systems, Mechanical Engineering, English Program

Dalian Maritime University, Liaoning, China (Bachelor) **Sept. 2016 – Jul. 2020**

Mechanical Engineering, English Program, *pilot class*

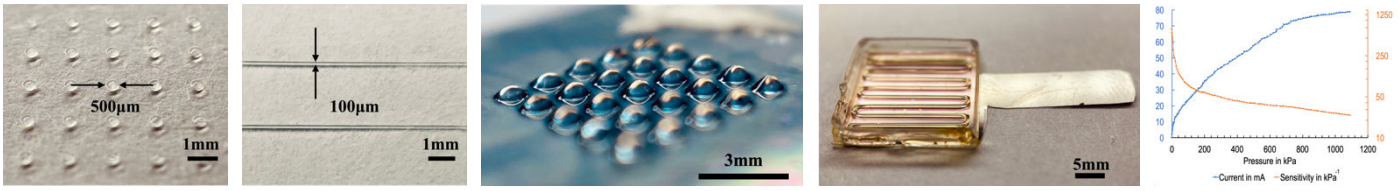
PROJECT EXPERIENCE

Soft Robotics

1. Direct ink writing of pure PDMS for soft 3D microstructures and tactile sensors **Oct. 2020 – June 2021**

21st IEEE Transducers, 16th IEEE NEMS, ***oral presentation***

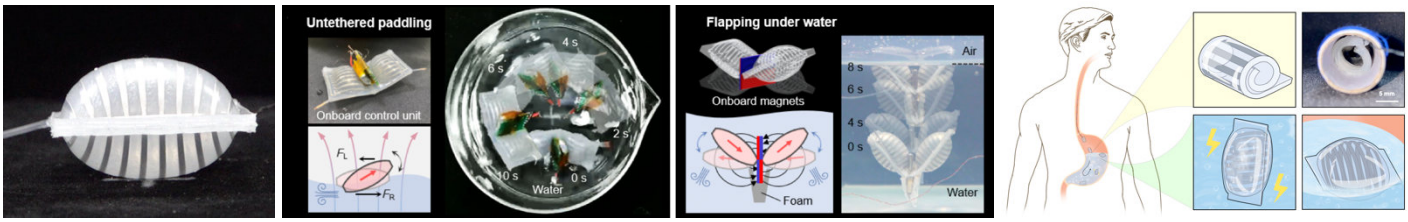
- Fabricate soft 3D microstructures based on direct ink writing (DIW) using pure PDMS.
- Show that the printing resolution of pure PDMS can approach 100 μm by combining optimized parameters.
- Display three all-printed tactile pressure sensors with piezoresistive, capacitive, and triboelectric mechanisms.



2. Self-vectoring electromagnetic soft robots with high operational dimensionality

Nature Communications, **14**, 182 **Mar. 2021 – Jan. 2023**

- Propose self-vectoring electromagnetic soft robots to instantly synthesizing the interior magnetic vectors.
- Reveal rapid 3D shape morphing, multimodal locomotion, fast (re)programmability, and selective actuation.
- Realize high-dimensional untethered operations with fewer actuators and control signals.

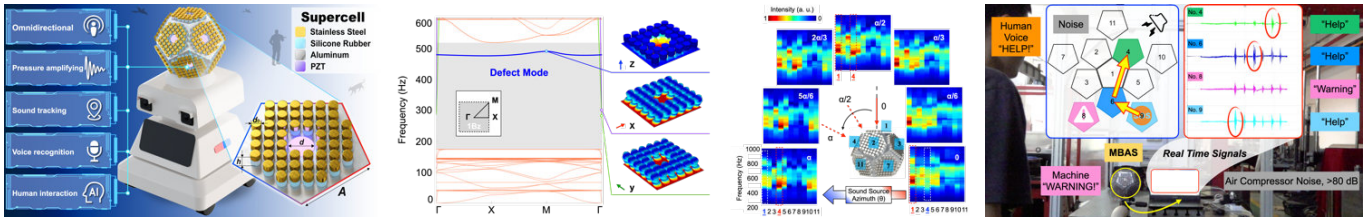


Metamaterials

3. A wave-confining metasphere beamforming acoustic sensor for superior human-machine voice interaction

Science Advances, **8**, eadc9230 **Apr. 2021 – Sept. 2022**

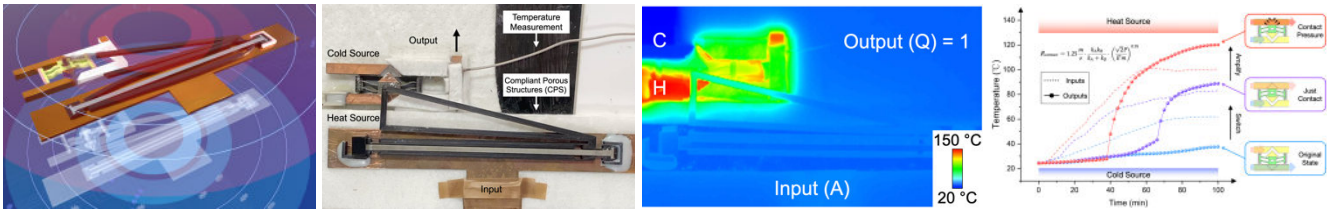
- Present a wave-confining metasphere (acoustic metamaterial sphere) beamforming acoustic sensor.
- Achieve the high SNR (72 dB) and sensitivity (-26.3 dBV) simultaneously, with daily frequencies (0-1500 Hz).
- Demonstrate audio cloning, source localization and speech recognition in a noisy environment (> 80 dB).



4. Mechanical transistors for logic-with-memory computing

Submitted, arXiv:2306.02352. **June 2021 – Present**

- Propose a mechanical transistor to modularly form various combinational and sequential circuits.
- Establish a universal processing core comprising an arithmetic unit and a register in a physical network.
- Demonstrate the self-unfolding of aerospace solar sails with environmental thermal inputs.



PUBLICATIONS

1. **H. Chen**, W. Zhang, *et al*. Direct ink writing of pure PDMS for soft 3D microstructures and tactile sensors. *21st International Conference on Solid-State Sensors, Actuators and Microsystems (**IEEE Transducers**)*, 521-528 (2021).
2. **H. Chen**, C. Song, *et al*. Mechanical transistors for logic-with-memory computing. arXiv:2306.02352 (2023).
3. W. Li†, **H. Chen**†, *et al*. Self-vectoring electromagnetic soft robots with high operational dimensionality. ***Nat. Commun.*** **14**, 182 (2023). [Editor's Highlight in *Nature Communications*]
4. K. Ma†, **H. Chen**†, *et al*. A wave-confining metasphere beamforming acoustic sensor for superior human-machine voice interaction. ***Sci. Adv.***, **8**, eadc9023 (2022). [Reported by *ScienceAAAS*]
   †: These authors contributed equally to the current work.
5. Q. Ding, **H. Chen**, *et al*. ***IEEE Sens. J.*** 11552-11561, (2022).
6. Q. Ding, **H. Chen**, *et al*. *16th International Conference on Nano/Micro Engineered and Molecular Systems (**IEEE NEMS**)*, 1297-1300 (2021).

TOEFL: 105 (Reading: 29, Listening: 28, Speaking: 21, Writing: 27) **2022-2024**