

Yanhao Luo

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EDUCATION

Xiamen University

Master of Physical Electronics

Xiamen, Fujian, China

Sep 2023 – Jun 2026

- GPA: 3.54/4.0.
- Supervisor: Prof. Xinqin Liao
- Research Focus: Flexible Sensor and Human-Machine Interactions

Zhengzhou University

Bachelor of Measurement & Control Technology and Instruments

Zhengzhou, Henan, China

Sep 2019 – Jun 2023

- GPA: 3.46/4.0.
- Main Courses: Digital Electronics (98), Circuit Analysis (89), Analog Electronics (88), Microcontroller Principles (85), Object-Oriented Programming (95), Digital Image Processing (87), MATLAB & Mathematical Modeling (96), Automatic Control Theory (90), Digital Signal Processing (88), etc.

PUBLICATIONS

Papers

- Y. L., et al. In-Sensor Computing Tactile Devices for Well-Defined Confined Space Interactions. *ACS Nano*. (Minor Revision) (First Author; JCR Q1; IF: 16.1).
- H. C., Z. H., Y. L., et al. Bioinspired Cross-Modal Self-Adaptive Machine Intelligence for Event-Driven and Ultrahigh-Precision Underwater Grasping. *Advanced Materials*. (Major Revision) (Third Author; JCR Q1; IF: 26.8).
- Z. H., H. C., Y. L., et al. In-Device Topological Encoding for Intelligent Multimodal Interactions. *Advanced Functional Materials*, 2025, 202515750. (Accepted) (Third Author; JCR Q1; IF: 19.0.).
- W. L., H. W., R. W., Y. L., et al. Dielectrically Modified Polymer and Topologically Optimized Microstructure Enabling In-Sensor Decoupling for Multifunctional Human–Machine Interactions. *Advanced Functional Materials*, 2025, 202505912. (Accepted) (Fourth Author; JCR Q1; IF: 19.0).
- S. Y., Z. J., L. L., Z. H., Y. L., et al. A Hyperconformal Dual-Modal Metaskin for Well-Defined and High-Precision Contextual Interactions. *Nature Communications*. 2025, (Accepted) (Fifth Author; JCR Q1; IF: 15.7)

Patents

- X. L., Y. L., et al. Flexible Sensor Continuous Mass Production System and Method. *Chinese Invention Patent*. No.: CN118849484A. (Granted) (Second Author; Supervisor as First Author).
- X. L., H. C., Y. L., et al. Fabric-Based Pressure Sensor and Preparation Method. *Chinese Invention Patent*. No.: CN120063542A. (Published) (Third author; Supervisor as First Author).

RESEARCH EXPERIENCE

Modular Tactile Sensors for Cut-and-Paste Interaction (Corresponding to Paper 1)

Introduction: Developed a high-throughput SH-CHTF system for scalable in-sensor computing tactile devices, enabling high-yield manufacturing, superb device performance and intelligent human-machine interactions.

- Developed a spray-heating continuous high-throughput fabrication system; optimized deposition through COMSOL to achieve uniform conductive film coatings and stable large-scale sensor production.

- Designed an ultrathin, symmetric double-layer sensor enabling cut-and-paste Interaction, whose stable and consistent fabrication allows replacement without calibration.
- Developed multiple interactive systems, including smart hat, bottle and bracelet, by integrating designed PCBs and Unity interaction scenes, forming a complete tactile sensing and real-time feedback platform.

Visual-Tactile Cross-Modal Fusion Systems (*Corresponding to Paper 2*)

Introduction: Developed a bio-inspired visuo-tactile fusion system capable of 97.7% accuracy object recognition and adaptive grasping of challenging items like transparent and underwater objects.

- Built a vision–tactile fusion piano system powered by YOLOv5, enabling autonomous score reading, robotic performance, and volume control.
- Designed a vision–tactile fusion system integrating YOLOv5 visual features and 1D CNN tactile signals, optimizing recognition performance for visually similar objects with improved accuracy and robustness.

Multimodal Sensing Technology Based on Signal Linear Encoding (*Corresponding to Paper 3*)

Introduction: Designed an in-device topological encoding interface, enabling addressable perception and fusion of tactile location and pressure within a single channel and adaptive human–machine interaction.

- Designed a tactile interaction system capable of detecting both touch position and pressure, enabling real-time 3D model control in Unity without the need for cameras or complex wiring.

Composite Structures for Pressure and Distance Detection in Tactile Sensors (*Corresponding to Paper 4*)

Introduction: Engineered a dual-sensor haptic interface with extended detection range (7cm proximity, 360kPa pressure), facilitating accurate intention recognition for robotics and VR/AR applications.

- Built an embodied sensing network integrated with Unity classroom scene to enable diverse virtual interactions, and designed a proximity-based contactless presentation control system.
- Completed PCB design and embedded development, and created a closed haptic loop by integrating a Unity-based combat scene with thermal feedback that delivers heat sensations upon character hits.

Dual-Modal Skin: Enabling High-Precision Contextual Interactions (*Corresponding to Paper 5*)

Introduction: Developed a hyperconformal dual-modal metaskin enabling high-precision, crosstalk-free proprioceptive and tactile sensing through polarity-differentiated signal decoupling from a single data channel.

- Developed a wearable sensing system integrated with a Unity object-grabbing scene, where motion type and signal amplitude were used to control grabbing direction and distance with precision.

HIGHLIGHT OF QUALIFICATIONS

- Data Analysis: **Origin** and **MATLAB**.
- Visualization: **Adobe Illustrator**, **Photoshop**, and **Premiere**.
- Programming & Development: **Python**, **C#**, **C++** and **Unity**.
- Virtual Development: **COMSOL**, **3ds Max** and **SOLIDWORKS**.
- Embedded System Development: **Altium Designer**, **Multisim**, **Proteus**, and **JLCPCB**; **Arduino** and **Keil**.
- Instrumentation: Proficient in fabricating **Flexible tactile sensors** and **Wearable devices**; Operating key lab equipment, including **SEM**, **optical microscopes**, **vacuum heat treatment furnaces**, **spin coaters**, etc.
- Language Proficiency: **IELTS 6.5** (6.0).

AWARDS

Merit Student	Xiamen University	2025
Merit Student	Zhengzhou University	2020
Scholarship	Zhengzhou University	2020、2021、2022、2023
Second Prize (National)	Undergraduate Mathematical Contest in Modeling (CUMCM)	Sep 2021
Honorable Mention	Mathematical Contest in Modeling (MCM/ICM), COMAP (USA)	2022