

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. Liao Xinqin; Research Focus: Flexible Tactile Sensor

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

- Yanhao Luo, et al. High-throughput fabrication of integrated tactile device with in-sensor analysis. *Advanced Materials*. (Submitted) (First Author; JCR Q1; IF: 26.8).
- Hongyu Chen, Yanhao Luo, et al. Humanoid machine intelligence using bioinspired exteroceptive adaptive learning. *Science Robotics*. (Submitted) (Second Author; JCR Q1; IF: 27.5).
- Zijian Huang, Hongyu Chen, Yanhao Luo, et al. In-Device Topological Encoding for Intelligent Multimodal Interactions. *Advanced Functional Materials*, 2025. Doi: 10.1002/adfm.202515750. (Accepted) (Third Author; JCR Q1; IF: 19.0.).
- Wansheng Lin, Huasen Wang, Ruize Wangyuan, Yanhao Luo, et al. Dielectrically Modified Polymer and Topologically Optimized Microstructure Enabling In-Sensor Decoupling for Multifunctional Human–Machine Interactions. *Advanced Functional Materials*, 2025, Doi: 10.1002/adfm.202505912. (Accepted) (Fourth Author; JCR Q1; IF: 19.0.).
- Shifan Yu, Zhenzhou Ji, Lei Liu, Zijian Huang, Yanhao Luo, et al. A Hyperconformal Dual-Modal Metaskin for Well-Defined and High-Precision Contextual Interactions. *Nature Communications*. (Accepted) (Fifth Author; JCR Q1; IF: 15.7)

Patents

- Xinqin Liao, Yanhao Luo, et al. Flexible Sensor Continuous Mass Production System and Method. *Chinese Invention Patent*. No.: CN118849484A. (Granted) (Second Author; Supervisor as First Author).
- Xinqin Liao, Hongyu Chen, Yanhao Luo, 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*)

- Developed a spray-heating continuous high-throughput fabrication system; optimized deposition via 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 by integrating JLCEDA-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*)

- 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*)

- 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 Distance Detection in Tactile Sensors (*Corresponding to Paper 4*)

- 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*)

- 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 & Visualization:** Proficient in **Origin** and **MATLAB** for computation, data analysis, and modeling;
- Skilled in **Adobe Illustrator**, **Photoshop**, and **Premiere** for professional graphics design, image editing, and video processing.
- **Programming & Development:** Expert-level proficiency in **Python**, **C#**, and **C++** for model building, training, and UI design; Strong background in algorithm development and implementation.
- **Virtual Development:** Experienced with **Unity** for 3D modeling, animation design, interface development, and HCI systems; Proficient in **COMSOL** for multiphysics simulations (e.g., mechanics); Familiar with **3ds Max** and **SOLIDWORKS** for efficient 3D modeling and engineering drafting.
- **Embedded System Development:** Proficient in circuit design using **Multisim**, **Proteus**, **Altium Designer**, and **JLCPCB EDA**; experienced in Arduino hardware control and sensor programming; skilled in 32-bit microcontroller development using **Keil**.
- **Instrumentation:** Proficient in fabricating **various flexible tactile sensors** and operating laboratory equipment including operating Scanning Electron Microscopes (**SEM**), **optical microscopes**, **vacuum heat treatment furnaces**, **spin coaters**, and **spray-coating equipment**.
- **Language Proficiency:** **IELTS 6.5 (6.0)**.

AWARDS

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