

Tianyi Wang

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Research Interests: Smart Sensors, MEMS, Micro and Nano Fabrication Technologies

EDUCATION

East China University of Science and Technology (ECUST) ♦ Major: Process Equipment and Control Engineering GPA: 90.08/100 Ranking: 1/127 University of Windsor (UWindsor) ♦ Research Assistant (Mitacs Globalink Research Internship Full Scholarship)	Shanghai, China <i>Sept. 2022-Present</i> Windsor, ON, Canada <i>July 2025-Oct. 2025</i>
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PUBLICATIONS

[1] Chao Zhang, **Tianyi Wang**, Guozhu Zhang*, et al. (2025). Rational Design and Fabrication of MEMS Gas Sensors toward Long-Term Stability: A Comprehensive Review. (**Accepted by Advanced Science, advs.202511555R2**)

[2] **Tianyi Wang**, Longqi Wu, Guozhu Zhang*, et al. (2025). Humidity-Tolerant Chemiresistive Hydrogel Sensor for Real-Time Breath CO₂ Monitoring. (Under Review)

[3] Chao Zhang, **Tianyi Wang**, Guozhu Zhang*, et al. (2025). S-TCN Neural Networks for Gas Detection: Algorithm Design and Implementation on Edge Devices. (Submitted)

[4] **Tianyi Wang**, Longqi Wu, et al. (2025). Method for Monitoring Human Health Based on a CO₂ Sensor and a Health-Monitoring Mask Integrated with the Sensor. CN **202511182610.2** (Patent)

[5] **Tianyi Wang**, Longqi Wu, et al. (2025). Encapsulation Structure of Epitaxial Gate ISFET pH Electrode. (Patent)

[6] Guozhu Zhang, Chengze Gao, **Tianyi Wang**, et al. (2024). Manufacturing Methods and Application of CO₂ Gas Sensor Based on Hydrogel Structure. CN **202411089663.5** (Patent)

RESEARCH EXPERIENCE

Embedded Hardware Development for GroGenesis V2 Greenhouse Sensor System <i>Research Assistant (Mitacs Globalink Research Internship)</i> ♦ Participated in circuit design and multilayer PCB layout for a miniaturized environmental monitoring node. ♦ Performed soldering, debugging, and functional testing on multiple hardware prototypes to ensure stable sensor communication and power regulation. ♦ Developed Arduino-based firmware and implemented long-term Wi-Fi data logging and stability monitoring to support cloud acquisition and remote visualization.	<i>July 2025-Present</i>
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S-TCN Neural Networks for Gas Detection: Algorithm Design and Implementation on Edge Devices <i>Key Contributor</i> ♦ Built a multi-channel gas sensor array and designed a 4-layer PCB. ♦ Developed an S-TCN model using dilated depthwise separable convolutions to improve accuracy and efficiency. ♦ Deployed the model on a microcontroller, achieving real-time gas identification with over 98% accuracy.	<i>June 2024-July 2025</i>
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Rational Design and Fabrication of MEMS Gas Sensors toward Long-Term Stability: A Comprehensive Review <i>Key Contributor</i> ♦ Reviewed MEMS gas sensors and identified core failure modes affecting long-term operational stability. ♦ Analyzed material degradation mechanisms and evaluated stable electrode/sensing materials through literature mining and theoretical comparison.	<i>Sept. 2024-Apr. 2025</i>
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Humidity-Tolerant Chemiresistive Hydrogel Sensor for Real-Time Breath CO₂ Monitoring <i>First Author & Leader</i> ♦ Synthesized and optimized dimethylamine-functionalized hydrogels with enhanced CO ₂ sensitivity, mechanical stretchability, and humidity-assisted ionic conductivity. ♦ Designed a flexible PCB with integrated microcontroller, analog interface, and wireless modules for real-time CO ₂ signal acquisition and transmission. ♦ Integrated the sensor into a wearable smart mask and developed a mobile interface for real-time monitoring.	<i>July 2024-Mar. 2025</i>
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Design and Development of the Ion-Sensitive Field-Effect Transistor (ISFET) PH Sensor <i>Leader</i> ♦ Designed an epitaxial-gate ISFET sensor with a separated chip-packaging architecture to enhance long-term stability, replaceability, and signal isolation. ♦ Developed a compact signal acquisition circuit integrating low-noise amplification, temperature compensation, and reference electrode interfacing for stable pH readout.	<i>Sept. 2023-Dec. 2024</i>
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HONOUR & AWARDS

First Prize, International Innovation and Entrepreneurship Competition	2025
First Prize, Challenge Cup National Competition	2025
National Scholarship (First in Major) & Top-tier School Scholarship (Top 3%)	2024
Yihai Kerry National Scholarship	2024
ECUST Outstanding Student (Top 6%)	2024
ECUST First-Class Student (Top 6%)	2023

SKILLS

- ♦ **Techniques:** Altium Designer, Ansys, MATLAB, 3ds Max, Python, CAD, SolidWorks, MS Office
- ♦ **Languages:** Mandarin Chinese (Native), English (TOEFL: 104 / Best Score:106)