Zach (Xizhe) Hao

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Education

University of Washington — Seattle, WA
Master of Science in Electrical and Computer Engineering | GPA 3.88 — September 2024 – June 2026

Southern University of Science and Technology — Shenzhen, China
Bachelor of Science in Automation | Graduated with Distinction | GPA 3.51 — September 2020 – June 2024

Research Focus

I investigate how embedded sensing and interactive system design can be unified to create human-centered ubiquitous technologies. My research explores hardware-software co-design for wearables that sense and respond to human activity in real time, with applications in accessibility, health, and context-aware interaction.

Research Experience

Research Assistant | Ubicomp Lab | University of Washington — December 2024 – June 2026
Advisors: Dr. Shwetak Patel, PhD Student Alex Ching

- Investigated mechanically mediated sensing using strain gauges in ring and watch prototypes to improve precision and reduce signal noise
- Built synchronized BLE-based pipelines for multi-sensor acquisition
- Designed and evaluated compact CNN models for real-time gesture recognition with quantization for embedded deployment
- Integrated and analyzed PPG and strain data for a cuffless blood-pressure monitoring system, creating Python tools for real-time streaming and visualization

Research Assistant | Iyer Lab | University of Washington — April 2025 – June 2026
Advisors: Dr. Vikram Iyer, PhD Student Zachary Englhardt

- Designed and implemented CircuitSync, a system bridging circuit schematics and code to enhance LLM-based design and debugging for embedded systems
- Built the full-stack architecture including the bidirectional translation layer, backend integration with Arduino CLI, and multimodal prompt framework
- Conducted controlled user studies to evaluate usability and debugging efficiency, applying mixed-methods analysis combining SPACE metrics, SUS scores, and qualitative feedback

Research Assistant | Makeability Lab | University of Washington — August 2025 – June 2026
Advisors: Dr. Jon E. Froehlich, PhD Student Jaewook Lee

- Designed and implemented an AR running system that generates a spatialized "ghost pacer" to enhance pace awareness and motivation through auditory augmentation
- Developed real-time mono-to-spatial audio conversion using head-related transfer function (HRTF) modeling and integrated GPX-based trajectory tracking for dynamic, context-aware feedback generation
- Investigated LiDAR-based passive sensing for GlanceAR, enabling low-power obstacle detection and adaptive user feedback

Research Intern | Zhu Group | NC State University — January 2024 – February 2024
Advisor: Dr. Yong Zhu, PhD Student Shuang Wu

- Spearheaded the control segment of a pioneering caterpillar-inspired robot project, focusing on intricate circuit designs to facilitate multiple crawling modes through joule heating and friction manipulation
- Designed and executed control circuits on PCB board with NMOS switches for exact thermal-driven motion, integrating Wi-Fi and Bluetooth for dynamic robot control

Publications

Englhardt, Z., **Hao, X.**, Lin, T., Kao, C., Nissanka, D., Zhang, Z., Narayanswamy, G., Breda, J., Liu, X., Patel, S., Li, R., & Iyer, V. "CircuitSync: Bridging Physical Context Gaps in AI-Assisted Embedded System Development." *Manuscript submitted for publication at CHI 2026.*

Posters

Hao, X., Cheng, X., & Liu, G. "Smart Fully Automatic Flowerpot Based on a Micropump" *Undergraduate Research Showcase*, 2024. **(Distinguished Graduation Project Award)**

Hua, Y., Tang, H., **Hao, X.**, & Zhang, Y. "Network Circuit Experiment System Based on Digital Twin" *Undergraduate Innovation and Entrepreneurship Training Program Poster*, 2023.

Entrepreneurship Experience

Founder | Shenzhen Suishi Technology Co, Ltd. April 2023 – June 2024

- Partnered with top companies to launch a campus discount platform, expanding to 3 universities and reaching 10K+ users
- Achieved 68K+ views in one single post and used Tableau to analyze data and optimize engagement strategies

Awards and Distinctions

Graduated with Honors	2024
Distinguished Graduation Project Award (2nd Place among 26 projects)	2024
Ruoshui Scholarship (Top 10 among 833 students)	2023
Practicing Star (Top 36 among 4,804 students)	2023
Merit Student Scholarship	2022
Innovation and Entrepreneurship Award (Top 2 among 833 students)	2021

Skills

Programming: Python, C/C++, Verilog, MATLAB, Java
Embedded Systems & Hardware: Raspberry Pi, Arduino, ESP32, Xiao, STM32, DE1SoC, Zephyr RTOS, ROS, FPGA (Vivado, Quartus), EDA (KiCad, LTspice, Multisim)
Machine Learning: PyTorch, TensorFlow Lite, Edge Impulse

Relevant Coursework

- AI Mobile Robots
- Microprocessors and Microsystems
- Artificial Intelligence
- Tiny ML For Ultra Low -Power Edge Computing
- Big Data
- Signal Processing
- Mobile Applications for Sensing and Control
- Sensors and Applications
- Digital System Design

Service

Volunteer – Volunteer Association of SUSTech October 2020 – June 2024

- Contributed 200+ hours across 50+ diverse events, enriching children's science literacy
- Awarded the "Top 10 Volunteer" from Southern University of Science and Technology in 2022

President – News Agency of SUSTech September 2021 – September 2022

- Coordinated 100+ members to manage the official social media accounts of the university and its magazine
- Won the "Most Impactful University NewsWork" from China Youth Daily