

Siyu You

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EDUCATION

- **University of Electronic Science and Technology of China (UESTC)** Chengdu, China
B.Eng. in Electronics and Information Engineering Sep. 2022 – Jun. 2026
GPA: 3.91/4.00 (89.12/100) Rank: 17/246
Major Coursework: Circuit Analysis, Digital Signal Processing, Signals and Systems, Embedded Processors, Digital Communication, Electronic Devices, Machine Learning and AI
- **University of Glasgow** Glasgow, United Kingdom
B.Eng. in Electronics and Electrical Engineering Sep. 2022 – Jun. 2026
Dual Degree Program with UESTC; Degree Classification: **First Class Honours**

RESEARCH INTERESTS

Signal Processing, Time-Series Analysis, Wireless and Wearable Sensing, Internet of Things, and ML/AI for Sensor Data, Non-destructive Testing

PUBLICATIONS

- **Journal Papers**
 - **Siyu You**, Huayi Gou, Leilei Yang, Zhiliang Liu*, Mingjian Zuo, “Local Flaw Detection with Adaptive Pyramid Image Fusion Across Spatial Sampling Resolution for SWRs”, *IEEE Sensors Journal* (JCR Q1, IF=4.5).
 - Leilei Yang, Zhiliang Liu*, **Siyu You**, and Mingjian Zuo, “ILF Diagnosis for Steel Wire Ropes Based on Physical Information under Uniform Circular Array,” *NDT & E International* (JCR Q1, IF=6.0).
- **Conference Papers**
 - **Siyu You**, Leilei Yang, Zixu Kuang, Huayi Gou, Longlong Zhang, Zhiliang Liu*, “A Signal Matrix-Based Local Flaw Detection Framework for Steel Wire Ropes Using Convolutional Neural Networks”, *2025 International Conference on Mechatronics and Automation*, Oral Presentation.
 - Leilei Yang, **Siyu You**, Hailin Zhou, Zhiliang Liu*, “Weak LF Signal Detection Based on Multiscale Phase Spectrum Reconstruction for Steel Wire Ropes”, *IEEE PHM’Xi-an 2025 (Best Paper Award)*.
 - Boyuan Gu, Yanhui Yang, **Siyu You**, Haiyang Sun, Shisheng Guo*, “Improved VMD Based Remote Heartbeat Estimation Utilizing 60GHz mmWave Radar”, *IEEE SMC 2025*.

MANUSCRIPTS UNDER REVIEW

- **Siyu You**, Leilei Yang, Zhiliang Liu*, “MFLFormer: A Robust Physics-Informed Unsupervised Framework for Industrial Local Flaw Inspection of Steel Wire Ropes”, *IEEE Transactions on Industrial Informatics*, under revision.
- Shuaiqi Cheng, Jiahao Zhang, Boyuan Gu, **Siyu You**, Zexin Lu, Huiyu Zhou, Xuming Hu, “TamedFlow: Trajectory-Aware Distillation for Self-Speculative Diffusion Transformers”, *NeurIPS 2026*, under review.
- He Liu, Boyuan Gu, Shuaiqi Cheng, Haiyang Sun, **Siyu You**, and Xuming Hu, “PhysDox: Benchmarking LLMs on Physical Feasibility Auditing of Physiological Sensing Protocols,” *EMNLP 2026*, under review.

WORK EXPERIENCE

- **Algorithm Engineer Intern** Xiaomi
Wearable Algorithms Team Mar. 2026 - Jun. 2026
 - **VO₂ Max Estimation**: Developed wearable VO₂ max estimation algorithms for Xiaomi Band using physiological and motion signals, reducing estimation MAPE from 18% to 9% on internal validation data and outperforming competing wearable devices in real-world evaluation.
 - **Running Performance Prediction**: Built long-distance running performance prediction models with feature engineering, model training, error analysis, and robustness evaluation against reference measurements.
 - **Product Deployment**: Deployed and validated the algorithms on real wearable devices, with confirmed integration into an upcoming next-generation Xiaomi wearable product.

RESEARCH EXPERIENCE

- **WiFi-LLM: LLM-Aligned Representation Learning for WiFi CSI Sensing** UESTC
Final-Year Project, Outstanding Undergraduate Thesis (Top 10%) Sep. 2025 – Jun. 2026
 - **Framework:** Developed a two-stage framework combining masked self-supervised CSI pretraining with feature alignment to a frozen TinyLLaMA-1.1B for signal-to-text human activity recognition.
 - **Model Design:** Designed a frequency-aware ResNet encoder and lightweight GRU to learn transferable temporal-frequency representations, followed by an MLP projector for CSI-to-LLM alignment.
 - **Evaluation:** Achieved 92.4%, 96.2%, and 80.3% accuracy on UT-HAR, NTU-Fi, and WiFall, respectively, with extensive ablation, few-shot transfer, efficiency, and failure-case analyses.
- **Human Vital Sign Detection Using 60 GHz mmWave Radar** UESTC
Supervised by Prof. Shisheng Guo Oct. 2024 – May 2025
 - **Signal Processing:** Developed a non-contact vital sign sensing pipeline using 60 GHz FMCW mmWave radar, including range-bin selection, clutter suppression, phase extraction, and motion artifact mitigation.
 - **Heartbeat Estimation:** Applied Variational Mode Decomposition to separate respiration and heartbeat components from non-stationary radar phase signals, improving heartbeat estimation robustness under interference.
 - **Evaluation:** Validated the method against reference physiological measurements and analyzed estimation accuracy across different subjects and sensing conditions.
- **Dual-Task Learning for ECG-Based Identity and Activity Recognition** UESTC
Supervised by Prof. Shisheng Guo Oct. 2024 – May 2025
 - **Model Design:** Designed a multi-scale residual convolutional backbone for jointly learning ECG-based identity and activity representations across multiple temporal resolutions.
 - **Feature Modulation:** Proposed a subject-adaptive feature modulation mechanism that used stable identity representations to calibrate activity features and mitigate cross-subject distribution shifts.
 - **Evaluation:** Outperformed representative single-task and multi-task baselines on two public datasets and one in-house dataset while maintaining real-time inference capability.
- **Magnetic Flux Leakage Sensing for Steel Wire Rope Inspection** UESTC
Supervised by Prof. Zhiliang Liu Oct. 2023 – Present
 - **Robust Defect Detection Across Sampling Conditions:** Developed an adaptive multi-scale detection framework to handle distribution shifts caused by varying inspection speeds and spatial sampling resolutions. Designed target-oriented convolutional templates and pyramid feature fusion, achieving 96.7% F1-score on real industrial data and leading to a first-author publication in *IEEE Sensors Journal*.
 - **Physics-Guided Unsupervised Anomaly Detection:** Designed a Transformer-CNN reconstruction framework that preserves the topology of a uniform circular sensor array and incorporates local attention and physics-consistent constraints. Achieved 99.4% F1-score in fully unsupervised defect detection, with inference speed above 100 FPS and strong robustness across operating conditions.
 - **Defect Localization and Quantification:** Derived axial and circumferential magnetic leakage-field patterns to support angular localization and defect-depth estimation. Developed physics-guided localization and radial basis function-based quantification methods, achieving sub-millimeter localization error and quantification error within one broken wire.
 - **Research Outcomes:** Produced two first-author studies and contributed to multiple journal and conference papers on multi-channel MFL sensing, including publications in *IEEE Sensors Journal* and *NDT & E International*, a Best Paper Award at IEEE PHM 2025, and a Gold Medal at the International Exhibition of Inventions Geneva 2025.

HONORS AND AWARDS

Honors

- **Outstanding Individual in Academic and Scientific Innovation (Top 30 university-wide)**, UESTC 2026
- **James Watt Innovation Scholarship (Top 5 in cohort)**, University of Glasgow 2025
- **Yanbao Scholarship (Top 5%)** 2025
- **First-Class Scholarship (Top 10%, three consecutive years)**, UESTC 2023–2025

Awards

- **Best Paper Award**, IEEE Prognostics and Health Management Conference, Xi'an 2025
- **Gold Medal**, International Exhibition of Inventions Geneva 2025
- **Silver Award**, China International College Students' Innovation Competition 2024

LEADERSHIP ACTIVITIES

- **Peer Mentor**, Class of 2024 Freshmen, UESTC Aug. 2024 – Jun. 2025
 - Guided and supported incoming freshmen through their transition to university life, organized orientation activities, and acted as a liaison between students and faculty.
- **President**, Piano Association, UESTC Sep. 2023 – Aug. 2024
 - Managed association operations including budgeting and scheduling. Led a team of 10 members to organize musical events attracting over 1000 participants annually.

PROFESSIONAL SKILLS

- **Software**: Proficient in Ansys Maxwell, COMSOL, Vivado, LTspice, Origin
- **Programming**: Advanced in MATLAB, C, Python (PyTorch, TensorFlow), LaTeX; Basic in Verilog
- **Languages**: Chinese Mandarin (Native), English (IELTS: 7.5, GRE: 324)