XIANGYU YIN

PHD CANDIDATE

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EXPERIENCE

University of Pittsburgh **Pittsburgh, PA, USA**
Intelligent System Lab, Department of Electrical & Computer Engineering

Graduate Student Researcher ***Aug 2019 – Present***
Mobile Sensing & Machine Learning

- Developed a smartphone-based acoustic sensing system and machine learning pipeline to evaluate pulmonary diseases (e.g., asthma, COPD).
  - Engineered core signal processing and machine learning algorithms in Python (PyTorch) and MATLAB for disease classification and severity assessment.
  - Designed and built the complete data acquisition ecosystem, including a user-facing Android application, a backend server for data management, and custom 3D-printed hardware (mouthpieces, adapters) to ensure signal quality.
- Leading the development of a vision-based AI application to simplify prosthesis alignment for individuals with disabilities.
  - Constructed a large-scale, semi-automated annotated video dataset of prosthetic gait to enhance model performance in detection, segmentation, and pose estimation.
  - Integrating Large Language/Vision Language Models (LLMs/VLMs) to create an interactive, AI-assisted gait analysis and prosthesis alignment solution.
- Provided core technical support across multiple AI-related projects, focusing on deploying and optimizing machine learning models (especially LLMs) on mobile devices for improved efficiency and explainability.
  - Successfully deployed customized LLMs on smartphones for efficient on-device training and inference, significantly reducing latency and enhancing user data privacy.
  - Co-developed a novel modality adaptation technique to improve sensor fusion reliability for autonomous vehicle systems.

Teaching Assistant ***Aug 2020 – Apr 2022***
Embedded System Design:

- Developed and delivered lectures on hands-on lab experiments using Raspberry Pi.
- Designed and authored lab materials covering core embedded concepts such as cache manipulation, I/O interfacing, and process scheduling.

Computer Networks:

- Designed and administered take-home lab assignments centered on network packet analysis using Wireshark.
- Instructed students on the practical application of network protocols including TCP/IP, UDP, DNS, and DHCP through real-world network traffic capture.

University of Science and Technology of China **Hefei, Anhui, China**
Department of Automation

Research Assistant ***Aug 2017 – June 2019***

- Developed a hardware-in-the-loop (HIL) simulation toolchain for testing UAV flight control system.
- Developed a rolling ball control system using STM32. Attended National Undergraduate Electronics Design Contest and won the National Second Prize / Provincial First Prize

EDUCATION

Ph.D. in Electrical & Computer Engineering **Present**
University of Pittsburgh, Pittsburgh, PA, USA
Supervised by Dr. Wei Gao

B.Eng. in Automation **June 2019**
University of Science and Technology of China, Hefei, Anhui, China
Enrolled in the Talent Program in Information Science and Technology
Graduated from the School of the Gifted Young

SKILLS & ABILITIES

Programming Skills: *Python*, *MATLAB*, C/C++, Java, JavaScript, HTML, SQL

Professional Skills: AI Model Development, Embedded Development, Android/Web App Development, Signal Processing & Analysis, 3D Modeling & Printing, PCB Design, Video Editing

Hardware Platforms: Android, STM32, Raspberry Pi, Nvidia Jetson

PUBLICATIONS

1. **[ICCV'25] Yin, X.**, Yang, B., Liu, W., Xue, Q., Alamri, A., Fiedler, G., & Gao, W. (2025). ProGait: A Multi-Purpose Video Dataset and Benchmark for Transfemoral Prosthesis Users. *arXiv preprint arXiv:2507.10223*. https://doi.org/10.48550/arXiv.2507.10223
2. **[MobiSys'25]** Wang, H., Yang, B., **Yin, X.**, & Gao, W. (2025). Never Start from Scratch: Expediting On-Device LLM Personalization via Explainable Model Selection. https://doi.org/10.48550/arXiv.2504.13938
3. **[arXiv]** Song, J., Huang, K., **Yin, X.**, Yang, B., & Gao, W. (2024). Achieving Sparse Activation in Small Language Models. *arXiv preprint arXiv:2406.06562*. https://doi.org/10.48550/arXiv.2406.06562
4. **[CVPR'25]** Xue, Q., **Yin, X.**, Yang, B., & Gao, W. (2025). Phyt2v: Llm-guided iterative self-refinement for physics-grounded text-to-video generation. In *Proceedings of the Computer Vision and Pattern Recognition Conference* (pp. 18826-18836). https://doi.org/10.48550/arXiv.2412.00596
5. **[MobiCom'25]** Huang, K.*, **Yin, X*.**, Huang, H., & Gao, W. (2025). Modality plug-and-play: Runtime modality adaptation in LLM-driven autonomous mobile systems. In *ACM MobiCom*. https://sites.pitt.edu/~weigao/publications/mobicom25_mpnp.pdf
6. **[MobiCom'24]** Huang, K., **Yin, X.**, Gu, T., & Gao, W. (2024). Perceptual-Centric Image Super-Resolution using Heterogeneous Processors on Mobile Devices. In *Proceedings of the 30th Annual International Conference on Mobile Computing and Networking* (pp. 1361-1376). https://doi.org/10.1145/3636534.3690698
7. **[MobiSys'23] Yin, X.**, Huang, K., Forno, E., Chen, W., Huang, H., & Gao, W. (2023). PTEase: Objective Airway Examination for Pulmonary Telemedicine using Commodity Smartphones. In *Proceedings of the 21st Annual International Conference on Mobile Systems, Applications and Services* (pp. 110-123). https://doi.org/10.1145/3581791.3596854
8. **[CML-IOT'22/SenSys'22] Yin, X.**, Huang, K., Forno, E., Chen, W., Huang, H., & Gao, W. (2022). Out-Clinic Pulmonary Disease Evaluation via Acoustic Sensing and Multi-Task Learning on Commodity Smartphones. In *Proceedings of the 20th ACM Conference on Embedded Networked Sensor Systems* (pp. 1182-1188). https://doi.org/10.1145/3560905.3568437 (**Best Paper Award**)

* Equal contribution