Yunqi Guo

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Ho Sin Hang Engineering Building, CUHK, Hong Kong

R&D Interests

My research sits at the intersection of IoT/AR/mobile systems, visual–language interaction, and intelligent sensing, with a user-centered perspective. I pursue two complementary agendas: accessibility tech simplifying everyday interactions and AIoT-based eldercare systems enabling healthy, independent aging.

Education

Ph.D., Computer Science, **University of California, Los Angeles**, USA April 2018 - Sep. 2023
Advisor: Prof. Songwu Lu
Thesis: Enhancing Accessible Communication – Assistive AR System in Bridging the Deaf and Hearing Divide

M.S., Computer Science, **University of California, Los Angeles**, USA Sep. 2016 - March 2018
Thesis: Key Reinstallation Attack in NB-IoT Network: Vulnerability and Cryptanalysis

B.S., Computer Science, **Shanghai Jiao Tong University**, China Sep. 2012 - June 2016
Advisor: Prof. Xinbing Wang
Thesis: AceMap – Mining and Visualizing Large-Scale Academic Relationship

Honors and Awards

- **Best Paper Award**, ACM MobiCom 2025 (for AquaScan)
- **Rising Star Award**, ACM MobiSys 2025 (for Assistive AR System)
- **Keynote Speaker**, MIMSVAI Workshop at UbiComp/ISWC 2025

Experience

The Chinese University of Hong Kong February 2024 – Present
Postdoctoral Fellow, working with Prof. Guoliang Xing

- Lead the development of LLM-enhanced eldercare systems with privacy-preserving sensing, serving elderly communities in both urban and rural settings
- Collaborate with local nursing homes and hardware manufacturers to monitor over 80 elderly individuals, designing efficient models for embedded devices to provide real-time caregiver assistance

University of California, Los Angeles April 2018 - Sep. 2023
Graduate Student Researcher, Advisor: Prof. Songwu Lu

- **AnySign:** A cross-device domain-oriented bidirectional sign language interaction system
  - Provided instant and accessible mobile sign language translation via assistive AR glasses
  - Directed an interdisciplinary team of more than 10 members and collaborated with linguistics experts, the Deaf community, and smart glass vendors
- **Assistive AR:** Mobile-assisted smart glasses for everyday assistance
  - Enabled ML/AI services on resource-constrained smart glasses with Bluetooth offloading;
  - Improved AR services 10x for mega-events with scalable multi-view rendering and multicasting
- **Model Security:** Designed lightweight, model-centric protection strategies tailored for IoT systems
- **Mobile Security & Analytics:** Analyzed key reinstallation and SIM attacks in 5G and IoT networks

IBM T.J. Watson Research Center June - Sep. 2019 & 2020

PhD Research Intern

- Developed an attention-based model for multivariate time series analysis (1 US patent)
- Combined reinforcement learning and attention for dynamic time series dependency analysis

Sohu.com Inc. June - Aug. 2017

Machine Learning Intern

- Examined factors impacting online news quality across various topics and performed classification
- Utilized attention models to detect low-quality news, enhancing Sohu's mobile platform experience

Shanghai Jiao Tong University Sep. 2014 - June 2016

Undergraduate Research Intern

- Co-led AceMap: An academic search engine and recommendation system
- Directed a 25-member team to architect the graph mining infrastructure, enabling scalable visualization of academic relationships

Systems and Tools

AnySign (founder, 2021-Present): AnySign is a bidirectional sign-spoken language translation solution for smart glasses in collaboration with linguistic specialists, the Deaf community, and smart glasses vendors. It offers real-time sign recognition, translation, and production capabilities, all processed on mobile for immediate communication. Now under field trials with Deaf communities in California.

MobileInsight (core contributor, 2019-2021): MobileInsight is the first open-source community tool that empowers fine-grained mobile network analytics inside smartphones. It has been used by researchers from more than 300 academic and industrial institutions.

TinyGraphics.js (core contributor, 2019-2021): An open-source JavaScript 3D library designed to simplify the learning process of graphics and WebGL, benefiting over 1,000 computer graphics students.

AceMap (co-founder, 2015-2016): An academic search engine visualizing relations of papers, topics, and authors based on large-scale metadata. It reveals research trends and scholarly relationships to researchers.

Selected Publications

*AquaScan: A Sonar-based Underwater Sensing System for Human Activity Monitoring **[Best Paper Award]**,* **ACM MobiCom '25 2025,** Haozheng Hou, Bowen Zheng, Sitong Cheng, Xiaoguang Zhao, Peiheng Wu, Lixing He, **Yunqi Guo**, Guoliang Xing, Zhenyu Yan

Assistive AR System for Enhancing Human-Human and Human-Environment Interactions, **ACM MobiSys '25 (Rising Star Forum) 2025, Yunqi Guo**

SocialMind: LLM-based Proactive AR Social Assistive System with Human-like Perception for In-situ Live Interactions, **ACM IMWUT (UbiComp) 2025,** Bufang Yang*, **Yunqi Guo***, Lilin Xu*, Zhenyu Yan, Hongkai Chen, Guoliang Xing, Xiaofan Jiang. (*Co-first authors)

Sign-to-911: Emergency Call Service for Sign Language Users with Assistive AR Glasses, **ACM MobiCom 2023, Yunqi Guo**, Jinghao Zhao, Boyan Ding, Congkai Tan, Weichong Ling, Zhaowei Tan, Hongzhe Du, Jennifer Miyaki, Songwu Lu.

LDRP: Device-Centric Latency Diagnostic and Reduction for Cellular Networks without Root, **IEEE TMC 2023,** Zhaowei Tan, Jinghao Zhao, Yuanjie Li, Yifei Xu, **Yunqi Guo**, Songwu Lu.

A Model Obfuscation Approach to IoT Security, **IEEE CNS 2021, Yunqi Guo***, Zhaowei Tan*, Kaiyuan Chen, Songwu Lu, Ying Nian Wu. (*Co-first author)

On Key Reinstallation Attacks over 4G LTE Control-Plane: Feasibility and Negative Impact, **ACM ACSAC 2021,** Muhammad Taqi Raza, **Yunqi Guo**, Songwu Lu, Fatima Muhammad Anwar

SecureSIM: Rethinking Authentication and Access Control for SIM/eSIM, **ACM MobiCom 2021,** Jinghao Zhao, Boyan Ding, **Yunqi Guo**, Zhaowei Tan, Songwu Lu.

Data-Plane Signaling in Cellular IoT: Attacks and Defense, **ACM MobiCom 2021,** Zhaowei Tan, Boyan Ding, Jinghao Zhao, **Yunqi Guo**, Songwu Lu.

Experience: a Five-Year Retrospective of MobileInsight, **ACM MobiCom 2021,** Yuanjie Li, Chunyi Peng, Zhehui Zhang, Zhaowei Tan, Haotian Deng, Jinghao Zhao, Qianru Li, **Yunqi Guo**, Kai Ling, Boyan Ding, Hewu Li, Songwu Lu.

Towards Model-Centric Security for IoT Systems, **IEEE ICCCN 2020, Yunqi Guo**, Zhaowei Tan, Songwu Lu.

Miscellaneous

- Founded `AnySign.net`, advancing AI-driven sign language access and global tech inclusion
- Supported sign language interpretation at major tech conferences (e.g., MobiCom, CPS-IoT Week)
- **Interests**: Regularly visit accessibility-focused organizations; avid photographer; off-roading and motorcycling

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