Yunqi Guo

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R&D Interests

Assistive AI/AR systems, mobile/IoT/ML systems, sign language interaction, system security

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
Thesis: AceMap – Mining and Visualizing Large-Scale Academic Relationship

Experience

The Chinese Univeristy of Hong Kong   Feburary 2024 - Now
Postdoctoral Fellow
- Leading the development of AR/AI systems to enhance everyday life and professional efficiency.

University of California, Los Angeles   April 2018 - Sep. 2023
Graduate Student Researcher
- **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
  - Enable 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:** Model differential privacy for ML/AI applications
  - Designed lightweight, model-centric protection strategies tailored for IoT systems
- **Mobile Security & Analytics:** Analyzed key reinstallation and SIM attacks in 5G and IoT networks
  - Core contributor to MobileInsight, open-source tool for fine-grained 4G/5G mobile network analytics

IBM T.J. Waston 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

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 1st 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 institutes.

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 unfolds the trends and scholar relations to researchers.

Selected Publications

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, Jennifer Miyaki, Hongzhe Du, 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, **AMC 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. (Invited paper)

Technical Skills

Programming Skills	OpenGL, Python, C/C++, Java, Kotlin, JS, SQL, MATLAB, PHP
Tools & Framework	Android, TensorFlow, ARCore, Three.js, Filament, Blender, Unity

Misc.

Member of UCLA HandsOn Club, studying American Sign Language (ASL), appreciator of geometric abstraction art, amateur in off-roading and motorcycling