

Jinghao Zhao

<https://zhaojinghao.com> | jzhaouclacs@gmail.com | (310) 254-4651
Lab 396, 404 Westwood Plaza, Los Angeles, CA 90095

R&D INTERESTS

networked systems, mobile security, 5G/4G networks, edge/cloud computing

RESEARCH PROJECTS

SEED: In-SIM Mini System Handling 5G/4G Failures & Insecurity Jan. 2020 – Present

- First-reported open-source programmable eSIM supporting commodity cellular devices
- Enabled device-network collaborative diagnoses under the broken data plane by a novel SIM-based design
- Uncovered eavesdropping & impersonation affecting billions of cellular devices with SIM/eSIM vulnerabilities

Insecurity in 5G RCS Messaging Dec. 2021 – Oct. 2022

- Discovered 5G RCS cross-layer binding insecurity influencing billions of users' privacy & financial security

SONICA: Supporting Cellular IoT with SDR Jun. 2020 – Mar. 2022

- Devised open-source NB-IoT SDR testbed working with commodity IoT devices
- Uncovered large-scale cellular IoT attacks with low-cost devices leveraging data plane signaling

NEAR: Augmented Reality Meets Information-Centric Network Dec. 2018 – Oct. 2021

- Enabled 10x scalable edge AR services for mega-events by a new information-centric wireless design
- Devised plug-and-play cellular latency reduction for mobile VR&AR by rootless cellular configuration inference

PUBLICATIONS

Conference Papers • **J. Zhao**, Z. Tan, Y. Xu, Z. Zhang and S. Lu. "SEED: A SIM-Based Solution to 5G Failures", **ACM SIGCOMM 2022**.

• **J. Zhao**, B. Ding, Y. Guo, Z. Tan and S. Lu. "SecureSIM: Rethinking Authentication and Access Control for SIM/eSIM", **ACM MobiCom 2021**.

• **J. Zhao**, Q. Li, Z. Yuan, Z. Zhang and S. Lu. "5G Messaging: System Insecurity and Defenses", **IEEE CNS 2022**.

• Z. Tan, **J. Zhao**, B. Ding and S. Lu. "CellDAM: User-Space, Rootless Detection and Mitigation for 5G Data Plane", to appear in **USENIX NSDI 2023**.

• Z. Tan, **J. Zhao**, Y. Li, Y. Xu and S. Lu. "Device-Based LTE Latency Reduction at the Application Layer", **USENIX NSDI 2021**.

• Z. Tan, B. Ding, **J. Zhao**, Y. Guo and S. Lu. "Data-Plane Signaling in Cellular IoT: Attacks and Defense", **ACM MobiCom 2021**.

• Y. Li, C. Peng, Z. Zhang, Z. Tan, H. Deng, **J. Zhao**, Q. Li, Y. Guo, K. Ling, B. Ding, H. Li, and S. Lu. "Experience: A Five-Year Retrospective of MobileInsight", **ACM MobiCom 2021**.

• K. Chen and **J. Zhao**. "Skip The Question You Don't Know: An Embedding Space Approach", **IJCNN 2019**.

Journal Articles • Z. Zhang, Y. Li, Q. Li, **J. Zhao**, G. Baig, L. Qiu and S. Lu. "Movement-Based Reliable Mobility Management for Beyond 5G Cellular Networks", **IEEE/ACM TON 2022**.

• Z. Tan, B. Ding, **J. Zhao**, Y. Guo and S. Lu. "Breaking Cellular IoT with Forged Data-Plane Signaling: Attacks and Countermeasure", **ACM TOSN 2022**.

Others • **J. Zhao**, Y. Guo, L. Zhang and S. Lu. "NEAR Platform: Supporting Augmented Reality Over NDN", **NDNcomm 2021**.

• B. Ding, **J. Zhao**, Z. Tan, and S. Lu. "Sonica: an open-source NB-IoT prototyping platform", **ACM MobiCom 2021**.

PATENT

• Y.Li, Z. Yuan, **J. Zhao**, S. Lu. “*Methods, systems, apparatuses and devices for facilitating optimizing of a network connection established between the device and one or more servers*”, US patent, US20210112509A1, Apr. 2021.

EDUCATION

University of California, Los Angeles (UCLA)

Ph.D. Candidate in Computer Science

Advisor: Prof. Songwu Lu

Los Angeles, CA

Sep. 2018 – Expected Jun. 2023

Shanghai Jiao Tong University (SJTU)

B.E. in Electrical & Electronic Engineering

Shanghai, China

Sep. 2014 – Jun. 2018

INDUSTRIAL EXPERIENCE

Meta Platforms, Inc.

Software Engineer Intern | Golang, C++

Developed & deployed 5G GTP module & eBPF-based high-performance data plane for 5G UPF with 10000+ LoC

Palo Alto, CA

Jun. 2022 – Sep. 2022

MobiQ Technologies

Software Engineer | C/C++, Java, Android

Developed a device-based mobile gaming latency reduction solution (1 US patent) & Cooperated with two of the top-five global phone vendors (Xiaomi & Vivo) for integration

Los Angeles, CA

Jan. 2019 – Dec. 2020

TEACHING EXPERIENCE

CS118: Computer Network Fundamentals

Fall 2021 & Spring 2022

CS161: Fundamentals of Artificial Intelligence

Spring 2020 & Fall 2020 & Fall 2021

CS180: Introduction to Algorithms and Complexity

Summer 2020

HONORS

SIGCOMM 2022 Travel Grant

2022

NSF I-Corps Grant

2019

Member of Outstanding Engineers Education

2017

Academic Excellent Scholarship of SJTU

2015, 2016, 2017

SKILLS

Programming Languages: Python, C/C++, Java, Golang, C#, PHP, SQL, JavaScript, HTML, CSS, MATLAB

Tools and Framework: Android, Web, Unity, eBPF, Network Drivers, Docker, Kafka, Redis, PyTorch, Tensorflow

HOBBIES

Photography, Hiking, Camping, Woodworking