

Jincheng Wang | Curriculum Vitae

The Hong Kong Polytechnic University, Hong Hom, Hong Kong SAR

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EDUCATION

The Chinese University of Hong Kong

Ph.D. in Computer Science and Engineering

ANSR Lab, supervised by Prof. John C.S. Lui

Hong Kong

Aug.2018–June.2023

Huazhong University of Science and Technology

B.E. in Computer Science and Technology

ACM Distinguished Class

Wuhan

Aug.2014–Jun.2018

WORK EXPERIENCE

The Hong Kong Polytechnic University

Postdoc in Department of Computing

Supervised by Prof. Daniel Luo Xiapu

Hong Kong

June.2023–Now

RESEARCH INTEREST

My research interest is mainly IoT security. Specifically, my research covers popular security topics including (1) vulnerability analysis of device communication protocols/procedures, (2) data-driven anomaly detection, and (3) privacy threats and defense methodologies.

PROJECTS

Black-box fuzzing of IoT protocol stack

Supervisor: Prof. Daniel Luo Xiapu

PolyU

June.2023–December.2023

- Standard and proprietary protocol commands probing and reverse engineering
- Response-code guided fuzzing with high performance
- Identified vulnerabilities on real-world IoT devices

Anomaly detection for IoT devices using causal inference

Supervisor: Prof. John C.S. Lui

CUHK

Feb.2021–Oct.2022

- Revealed widespread IoT device interactions and anomaly propagations issues
- Designed causal discovery algorithm to profile device interactions
- Leveraged causal knowledge to identify runtime device anomalies

Security analysis of IoT communication protocols

Supervisor: Prof. John C.S. Lui

CUHK

June.2019–Feb.2021

- Leveraged formal verification approach to study security guarantees of Zigbee
- Designed Zigbee testing tools to verify identified vulnerabilities on real-world devices
- Collaborated with Zigbee Alliance and amended the Zigbee specification

Differential privacy (DP) under the attribute linkage threat

Supervisor: Prof. John C.S. Lui

CUHK

Aug.2018–June.2019

- Revealed insufficiencies of DP for defending against the attribute linkage attack
- Enhanced DP with topology-theoretic approach and proposed a new variant
- Designed an algorithm APLKILLER which better protects data privacy

PUBLICATIONS

Jincheng Wang, Le Yu, Xiapu Luo. LLMIF: Augmented Large Language Model for Fuzzing IoT Devices. To be appeared in *the 45th IEEE Symposium on Security and Privacy*. S&P 2024.

Jincheng Wang, Zhuohua Li, Mingshen Sun, Bin Yuan, and John C.S. Lui. IoT Anomaly Detection Using Causal Discovery. *the 53rd Annual IEEE/IFIP International Conference on Dependable Systems and*

Network. DSN 2023.

Jincheng Wang, Zhuohua Li, Mingshen Sun, and John C.S. Lui. Topology-Theoretic Approach To Address Attribute Linkage Attacks In Differential Privacy. *Computers & Security* (2021): 102552. [pdf]

Jincheng Wang, Zhuohua Li, Mingshen Sun, John C.S. Lui. Zigbee's Network Rejoin Procedure for IoT Systems: Vulnerabilities and Implications. In *the 25th International Symposium on Research in Attacks, Intrusions and Defenses*. RAID 2022. [demo]

Zhuohua Li, **Jincheng Wang**, Mingshen Sun, and John C.S. Lui. Detecting Cross-Language Memory Management Issues in Rust. To appear in *Proceedings of the 27th European Symposium on Research in Computer Security*. ESORICS 2022, Copenhagen, Denmark, September 2022.

Zhuohua Li, **Jincheng Wang**, Mingshen Sun, and John C.S. Lui. MirChecker: Detecting Bugs in Rust Programs via Static Analysis. In *Proceedings of the 28th ACM Conference on Computer and Communications Security*. CCS '21.

Zhuohua Li, **Jincheng Wang**, Mingshen Sun, and John C.S. Lui. Securing the Device Drivers of Your Embedded Systems: Framework and Prototype. In *Proceedings of the 3rd International Workshop on Security and Forensics of IoT (in conjunction with ARES 2019)*. IoT-SECFOR '19.

SERVICES

Journal Reviewer

Transactions on Dependable and Secure Computing (TDSC)

Conference Reviewer

International Conference on Security and Privacy in Communication Networks (SecureComm) 2023

HONORS & AWARDS

Student Travel Grants	June.2023, DSN
Hai Hang Scholarship for Outstanding Student	Oct.2017, HUST
First-class Scholarship for Outstanding Student	Oct.2016, HUST
National Scholarship	Nov.2015, HUST

COMPUTER SKILLS

Operating Systems: Linux, macOS, Windows

Programming Languages: Experienced in C/C++ and Python; familiar with R and Java

TEACHING ASSISTANT

CSCI3320: Fundamentals of Machine Learning	Spring 2019, CUHK
CSCI2040: Introduction to Python	Fall 2018, CUHK