Cheng Shen

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Education

- **Peking University** *EECS·Computer System Structure* 2018.09 – Now Ph.D. candidate
  - Database principle and technology, Deep learning technology, Network information architecture etc.
- **Peking University** *EECS·Machine Intelligence* 2014.09 – 2018.06 Bachelor's degree
  - Design and analysis of algorithm, Computer network and web technology, Signals and systems etc.

Internship

- **MSRA** *System Research Group · Security and Privacy* 2020.12 – 2021.08 Full-time
  - Study the threat of computer's electromagnetic leakage to users' privacy.
- **Huawei** *CSPL,2012 Lab & ALPHA LAB, HiSilicon* 2020.08 – Now Full-time
  - Hardware authentication and chip security design based on electromagnetic covert channel.

Research

- My main research interest lies in information security related to electromagnetic radiation (EMR) side channels in computing systems.
- In particular, I am committed to enhancing user privacy security by sensing EMR leakage from smart devices, such as authenticating computing devices and checking software legality. On the other hand, I am also interested in using EMR side channels to explore potential threats to user privacy, such as infiltrating air-gapped systems, sniffing browsers and cracking encryption keys.
- By introducing EMR side channels, I provide new solutions to traditional security problems, and also challenge some existing security standards.

Publicaitons

- **USENIX NSDI 2021 First Author**
  - Title: EarFisher: Detecting Wireless Eavesdroppers by Stimulating Memory EMR
  - Main Contribution: The first system that can detect wireless eavesdroppers and differentiate them from legitimate receivers.
- **IEEE S&P 2021 First Author**
  - Title: When LoRa Meets EMR: Electromagnetic Covert Channels Can Be Super Resilient
  - Main Contribution: A super resilient EM covert channel that exploits memory as a LoRa-like radio.

Awards

- **Peking University Merit Student Award (Top 5% in PKU)** 2020.11
- **Peking University President Scholarship (Top 1% in PKU)** 2021.06
- **Nomination Award of the MSRA Fellowship (28 people in Asian)** 2021.10
- **Academic Innovation Award of Peking University (Top 1% in PKU)** 2021.12

Projects

- **Off-load Security Monitoring Based on Side-channel** *2012 Lab* 2021.08-2022.03
  - Description: Using physical side-channel information to build the off-load identity and behavior authentication system for smart devices. Applicable scenarios include home IoT, smart office, IoV, etc.
- **Wireless Side Channel Platform Construction** *HiSilicon* 2021.08-2022.01
  - Description: By introducing wireless signal processing, this project extends the applicable scope of intrusive side-channel technology to wireless scenarios, greatly expanding the applicable scenarios of side-channel technology and reducing equipment costs.
- **Security Test of On-chip RSA Algorithm Implementation** *HiSilicon* 2022.01-2022.03
  - Description: This project attempts to evaluate the information leakage generated during the operation of the encryption chip through side channel technology. Combining circuit analysis and AI technology, we conduct security assessments on the protection methods in the implementation of the on-chip RSA algorithm and propose improvements.