

Cheng Shen

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CECA, PKU (Lab)



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 computer 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.
 - Main Design: Stimulate wireless eavesdroppers using bait network traffic, and capture eavesdroppers' responses by sensing and analyzing their memory EMRs.
- **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.
 - Main Design: Perform chirp spread spectrum modulation on the EMR signal of the memory bus to obtain high attenuation resistance similar to LoRa signals.

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