

WENHAO WANG

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EDUCATION

University of Chinese Academy of Sciences

Sept. 2009 - Jan. 2015

Ph.D. in Information Security

Supervisor: Prof. Dongdai Lin

Ocean University of China

Sept. 2005 - July 2009

B.E. in Computer Science and Technology

WORK EXPERIENCE

Institute of Information Engineering, CAS

Since Nov. 2018

Associate Professor

- State Key Laboratory of Information Security
- Courses: Security Chips (40 hours)

Indiana University Bloomington

Apr. 2016 - Aug. 2018

Visiting Researcher

- In collaboration with Prof. XiaoFeng Wang and Prof. Haixu Tang
- Participate in the organization of the iDash privacy & security workshop

Institute of Information Engineering, CAS

Feb. 2015 - Oct. 2018

Assistant Professor

- State Key Laboratory of Information Security

SELECTED PUBLICATIONS

✉ Corresponding author(s), — Advised by me, [] Equal Contributions

- *CryptPEFT: Parameter-Efficient Fine-Tuning for Privacy-Preserving Neural Network Inference*
Saisai Xia, **Wenhao Wang**[✉], Zihao Wang[✉], Yuhui Zhang, Yier Jin, Dan Meng, Rui Hou
Network and Distributed System Security Symposium (NDSS) 2026 (CCF-A)
- *Multivariate Template Attack against NTT based Polynomial Multiplication of Dilithium*
Haopeng Fan, Hailong Zhang[✉], Yongjuan Wang[✉], **Wenhao Wang**, Yanbei Zhu, Haojin Zhang, Qingjun Yuan
IEEE Transactions on Information Forensics and Security (TIFS) (CCF-A)
- *Comet: Accelerating Private Inference for Large Language Model by Predicting Activation Sparsity*
Guang Yan, Yuhui Zhang[✉], Zimu Guo, Lutan Zhao, Xiaojun Chen, Chen Wang, **Wenhao Wang**, Dan Meng, Rui Hou[✉]
2025 IEEE Symposium on Security and Privacy (S&P) (CCF-A)

- *The Road to Trust: Building Enclaves within Confidential VMs*
Wenhao Wang, Linke Song, Benshan Mei, Shuang Liu, Shijun Zhao, Shoumeng Yan[✉], XiaoFeng Wang, Dan Meng, Rui Hou[✉]
 Network and Distributed System Security Symposium (NDSS) 2025 (CCF-A)
- *Screening Least Square Technique assisted Multivariate Template Attack against the Random Polynomial Generation of Dilithium*
Haopeng Fan, Hailong Zhang[✉], Yongjuan Wang[✉], **Wenhao Wang**, Yanbei Zhu, Haojin Zhang, Qingjun Yuan
 IEEE Transactions on Information Forensics and Security (TIFS) (CCF-A)
- *ThermalScope: A Practical Interrupt Side Channel Attack Based On Thermal Event Interrupts*
 Xin Zhang, Zhi Zhang, Qingni Shen, **Wenhao Wang**, Yansong Gao, Zhuoxi Yang, Zhonghai Wu
 The 61st Design Automation Conference (DAC 2024) (CCF-A)
- *Cache attacks on subkey calculation of Blowfish*
Haopeng Fan, **Wenhao Wang**[✉], Yongjuan Wang, Xiangbin Wang, Yang Gao
 Journal of Computer Security (JCS) (CCF-B)
- *PP-Stream: A Privacy-Preserving Neural Network Inference Service with Stream Processing*
 Qingxiu Liu, Qun Huang, Xiang Chen, Sa Wang, **Wenhao Wang**, Shujie Han, Patrick P. C. Lee
 40th IEEE International Conference on Data Engineering (ICDE 2024) (CCF-A)
- *Verifying Rust Implementation of Page Tables in a Software Enclave Hypervisor*
 Zhenyang Dai, Shoumeng Yan, Vilhelm Sjoberg, Yu Chen, **Wenhao Wang**, Hongbo Chen, XiaoFeng Wang, Shubham Sondhi, Laila Elbeheiry, Sean Noble Anderson, Xinyuan Sun, Zhaozhong Ni, Kin-nary Dave, Xupeng Li, Yuekai Jia, Yu Zhang, Shuang Liu, Zhengyu He
 International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2024) (CCF-A)
- *SegScope: Probing Fine-grained Interrupts via Architectural Footprints*
 Xin Zhang, Zhi Zhang, Qingni Shen, **Wenhao Wang**, Yansong Gao, Zhuoxi Yang, Jiliang Zhang
 30th IEEE International Symposium on High-Performance Computer Architecture (HPCA 2024) (CCF-A)
- *The Danger of Minimum Exposures: Understanding Cross-App Information Leaks on iOS through Multi-Side-Channel Learning*
[Zihao Wang, Jiale Guan], XiaoFeng Wang, **Wenhao Wang**, Luyi Xing, Fares Alharbi
 ACM Conference on Computer and Communications Security (ACM CCS 2023) (CCF-A)
- *Tossing in the Dark: Practical Bit-Flipping on Gray-box Deep Neural Networks for Runtime Trojan Injection*
Zihao Wang, Di Tang[✉], XiaoFeng Wang, Wei He, Zhaoyang Geng, **Wenhao Wang**[✉]
 USENIX Security 2024 (CCF-A)
- *WhistleBlower: A System-level Empirical Study on RowHammer*
[Wei He, Zhi Zhang], Yueqiang Cheng, **Wenhao Wang**[✉], Wei Song, Yansong Gao, Qifei Zhang, Kang Li, Dongxi Liu, Surya Nepal
 IEEE Transactions on Computers (TC) (CCF-A)

- *Implicit Hammer: Cross-Privilege-Boundary Rowhammer through Implicit Accesses*
[Zhi Zhang, Wei He], Yueqiang Cheng, **Wenhao Wang**, Yansong Gao[✉], Dongxi Liu, Kang Li, Surya Nepal, Anmin Fu, Yi Zou
IEEE Transactions on Dependable and Secure Computing (TDSC) (CCF-A)
- *HyperEnclave: An Open and Cross-platform Trusted Execution Environment*
Yuekai Jia, Shuang Liu, **Wenhao Wang**[✉], Yu Chen, Zhengde Zhai, Shoumeng Yan, Zhengyu He
2022 USENIX Annual Technical Conference (USENIX ATC) (CCF-A)
- *SoftTRR: Protect Page Tables Against RowHammer Attacks using Software-only Target Row Refresh*
[Zhi Zhang, Yueqiang Cheng], Minghua Wang, Wei He, **Wenhao Wang**[✉], Nepal Surya, Yansong Gao, Kang Li, Zhe Wang, Chenggang Wu
2022 USENIX Annual Technical Conference (USENIX ATC) (CCF-A)
- *Trust Beyond Border: Lightweight, Verifiable User Isolation for Protecting In-Enclave Services*
Wenhao Wang, Weijie Liu, Hongbo Chen, XiaoFeng Wang, Hongliang Tian, Dongdai Lin
IEEE Transactions on Dependable and Secure Computing (TDSC) (CCF-A)
- *BitMine: An End-to-End Tool for Detecting Rowhammer Vulnerability*
[Zhi Zhang, Wei He], Yueqiang Cheng, **Wenhao Wang**, Yansong Gao[✉], Minghua Wang, Kang Li, Surya Nepal, Yang Xiang
IEEE Transactions on Information Forensics & Security (TIFS) (CCF-A)
- *Practical and Efficient in-Enclave Verification of Privacy Compliance*
Weijie Liu, **Wenhao Wang**[✉], Hongbo Chen, XiaoFeng Wang[✉], Xiaozhu Meng, Yaosong Lu, Hongbo Chen, Xinyu Wang, Qingtao Shen, Kai Chen, Haixu Tang, Yi Chen, Luyi Xing
51st IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2021) (CCF-B)
- *Randomized Last-Level Caches Are Still Vulnerable to Cache Side-Channel Attacks! But We Can Fix It*
Wei Song, Boya Li, Zihan Xue, Zhenzhen Li, **Wenhao Wang**, Peng Liu
2021 IEEE Symposium on Security and Privacy (S&P 2021) (CCF-A)
- *Enabling Rack-scale Confidential Computing using Heterogeneous Trusted Execution Environment*
Jianping Zhu, Rui Hou[✉], XiaoFeng Wang[✉], **Wenhao Wang**, Jiangfeng Cao, Boyan Zhao, Zhongpu Wang, Yuhui Zhang, Jiameng Ying, Lixin Zhang, Dan Meng
2020 IEEE Symposium on Security and Privacy (S&P 2020) (CCF-A)
- *Bluethunder: A 2-level Directional Predictor Based Side-Channel Attack against SGX*
Tianlin Huo, Xiaoni Meng, **Wenhao Wang**[✉], Chunliang Hao, Pei Zhao, Jian Zhai, Mingshu Li[✉]
IACR Transactions on Cryptographic Hardware and Embedded Systems (CHES 2020) (CCF-B)
- *Beware of Your Screen: Anonymous Fingerprinting of Device Screens for Off-line Payment Protection*
Zhe Zhou, Di Tang, **Wenhao Wang**, XiaoFeng Wang, Zhou Li, Kehuan Zhang
Annual Computer Security Applications Conference (ACSAC 2018) (CCF-B)
- *Correlation Cube Attacks: From Weak-Key Distinguisher to Key Recovery*
Meicheng Liu, Jingchun Yang, **Wenhao Wang**, Dongdai Lin

37th Annual International Conference on the Theory and Applications of Cryptographic Techniques (Eurocrypt 2018) (CCF-A)

- Racing in Hyperspace: Closing Hyper-Threading Side Channels on SGX with Contrived Data Races [Guoxing Chen, **Wenhao Wang**[✉]], Tianyu Chen, Sanchuan Chen, Yinqian Zhang, XiaoFeng Wang, Ten-Hwang Lai, Dongdai Lin
2018 IEEE Symposium on Security and Privacy (S&P 2018) (CCF-A)
- *A community effort to protect genomic data sharing, collaboration and outsourcing*
Shuang Wang, Xiaoqian Jiang, Haixu Tang, Xiaofeng Wang, Diyue Bu, Knox Carey, Stephanie OM Dyke, Dov Fox, Chao Jiang, Kristin Lauter, Bradley Malin, Heidi Sofia, Amalio Telenti, Lei Wang, **Wenhao Wang**, Lucila Ohno-Machado
NPJ genomic medicine
- *iDASH secure genome analysis competition 2017*
XiaoFeng Wang, Haixu Tang, Shuang Wang, Xiaoqian Jiang, **Wenhao Wang**, Diyue Bu, Lei Wang, Yicheng Jiang, Chenghong Wang
BMC Medical Genomics 2018
- *Leaky Cauldron on the Dark Land: Understanding Memory Side-Channel Hazards in SGX*
Wenhao Wang, Guoxing Chen, Xiaorui Pan, Yinqian Zhang, XiaoFeng Wang, Vincent Bind-schaedler, Haixu Tang, Carl A. Gunter
2017 ACM Conference on Computer and Communications Security (CCS 2017) (CCF-A)

MANUSCRIPTS

✉ Corresponding author(s), ____ Advised by me, [] Equal Contributions

- *Learning from Proof-of-Concepts: Hybrid Fuzzing of Deep Learning Compilers and Libraries*
Zizhuang Deng, Sanchuan Chen, Guozhu Meng, **Wenhao Wang**, Tong Liu, Xueqing Zhang, Yidi Kao, Kai Chen
In submission
- *The Early Bird Catches the Leak: Unveiling Timing Side Channels in LLM Serving Systems*
[Linke Song, Zixuan Pang], **Wenhao Wang**[✉], Zihao Wang, XiaoFeng Wang, Hongbo Chen, Wei Song, Yier Jin, Dan Meng, Rui Hou
In submission
- *virtCCA: Virtualized Arm Confidential Compute Architecture with TrustZone*
Xiangyi Xu, **Wenhao Wang**[✉], Yongzheng Wu, Zhennan Min, Zixuan Pang, Yier Jin[✉]
In submission
- *Understanding TEE Containers, Easy to Use? Hard to Trust*
[Weijie Liu, Hongbo Chen], XiaoFeng Wang, Zhi Li, Danfeng Zhang, **Wenhao Wang**, Haixu Tang
In submission
- *Toward Scalable Fully Homomorphic Encryption Through Light Trusted Computing Assistance*
Wenhao Wang, Yichen Jiang, Qintao Shen, Weihao Huang, Hao Chen, Shuang Wang, XiaoFeng Wang, Haixu Tang, Kai Chen, Kristin Lauter, Dongdai Lin

PATENTS

- *System for decentralized ownership and secure sharing of personalized health data*
Shuang Wang, XiaoFeng Wang, Haixu Tang, **Wenhao Wang**, Ali Farahanchi, Hao Zheng
US Patent 11,003,791

PROFESSIONAL SERVICES

- Reviewer for journals *IEEE TDSC*, *IEEE Security & Privacy*, *IEEE TC*, *ACM Transactions on Privacy and Security*, *CyberSecurity*, *SCN*, *JNCA*.
- Sub-reviewer for *CCS* (2018, 2020), *NDSS* (2017, 2018, 2021), *S&P* (2017, 2020, 2021), *Usenix Security* (2017, 2018, 2021), *HPCA* (2019), *ESORICS* (2018, 2020), *Asiacrypt* (2020), *AsiaCCS* (2017, 2018, 2019) and *RECOMB* (2019) etc.
- TPC member for *ACM CCS 2019*, *GenoPri* (2020, 2021), *ACNS* (2023).
- General Chair for *Inscript 2022*.

AWARDS

- 2018 ACM SIGSAC China Rising Star Award, and ACM China Rising Star Nomination Award
- 2017 Young Star Award of Institute of Information Engineering, CAS

TALKS

- *Confidential Computing, in Chinese*. China Conference on Data Security and Privacy (ChinaPrivacy2019), Oct. 2019, Guilin
- *Confidential Computing, in Chinese*. Nankai University, July 2019, Tianjin
- *Side Channel Risks in Hardware Trusted Execution Environments (TEEs)*, Institute of Software, July 2019, Beijing
- *Side Channel Risks in Hardware Trusted Execution Environments (TEEs)*. ACM TURC 2019 (SIGSAC), May 2019, Chengdu
- *Leaky Cauldron on the Dark Land: Understanding Memory Side-Channel Hazards in SGX*. ACM CCS 2017, Nov. 2017, Dallas