

Shan Wang

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Research Interests

Blockchain, Android Security, Cyber-Physical System (CPS) Security

My past work includes security analysis of consensus protocols, private data mechanisms and applications in the permissioned blockchain such as Hyperledger Fabric. Currently, I am working on crypto applications in blockchain and de-anonymization in the public blockchain.

Professional Experience

- 2023.05 – Present Postdoctoral Fellow, Department of Computing, The Hong Kong Polytechnic University. Hong Kong SAR. Advisor: Prof. Jiannong Cao.
- 2022.12 - 2023.05 Research Assistant, Department of Computer Science, University of Massachusetts, Lowell, MA, USA. Advisor: Prof. Xinwen Fu

Education Background

- 2019.09 - 2022.12 Joint Ph.D. Student in Computer Science, University of Massachusetts, Lowell, MA, USA. Advisor: Prof. Xinwen Fu
- 2016.09 – 2022.12 Ph.D. in Cyber Science and Engineering, Southeast University, Nanjing, China. Dissertation: *On Data Security and Data Sharing in Permissioned Blockchain* Advisor: Prof. Ming Yang
- 2012.08 – 2016.06 B.S. in Computer Science and Engineering, Southeast University, Nanjing, China. Got the exam-free postgraduate recommendation, 2015
Passed the independent recruitment of students test by Southeast University, 2012

Publications

- [10] **Shan Wang**, Ming Yang, Wenxuan Dai, Yu Liu, Yue Zhang, Xinwen Fu.
Blockchain "Deanonymizing Ethereum Users behind Third-Party RPC Services". [C]
INFOCOM'2024 *Proceedings of the 43rd IEEE International Conference on Computer Communications (INFOCOM'2024)*. Vancouver, Canada. May 20-23, 2024. [CCF-A][AR 19.6%, 256 out of 1307]
- [9] Shan Jiang, Jiannong Cao, Cheung Leong Tung, Yubin Wang, **Shan Wang**.
Blockchain "Sharon: Secure and Efficient Cross-shard Transaction Processing via Shard Rotation". [C]
INFOCOM'2024 *Proceedings of the 43rd IEEE International Conference on Computer Communications (INFOCOM'2024)*. Vancouver, Canada. May 20-23, 2024. [CCF-A][AR 19.6%, 256 out of 1307]
- [8] Lan Luo, Christopher Morales-Gonzalez, **Shan Wang**, Zhen Ling, Xinwen Fu.
CPS "Unified View of IoT and CPS Security and Privacy". [C]
ICNC'2024 *Proceedings of International Conference on Computing, Networking and Communications (ICNC'2024)*. Big Island, Hawaii, USA. February 20-22, 2024.

- [7] Michael Cash, Christopher Morales-Gonzalez, **Shan Wang**, Xipeng Jin, Alex Parlato, Jason Zhu, Qun Zhou Sun, Xinwen Fu.
CPS "On False Data Injection Attack against Building Automation Systems". [C]
ICNC'2023 *Proceedings of International Conference on Computing, Networking and Communications (ICNC'2023)*. Honolulu, Hawaii, USA. February 20 - February 22, 2023.
- [6] **Shan Wang**, Zhen Ling, Yue Zhang, Ruizhao Liu, Joshua Kraunelisk, Kang Jia, Bryan Pearson, and Xinwen Fu.
Android "Implication of Animation on Android Security". [C]
ICDCS'2022 *Proceedings of the 42st IEEE International Conference on Distributed Computing Systems (ICDCS'2022)*. Bologna, Italy. July 10 - July 13, 2022. [CCF-B] [AR 19.9%, 114 out of 573]
- [5] **Shan Wang**, Ming Yang, Tingjian Ge, Yan Luo, Xinwen Fu.
Blockchain "BBS: A Blockchain Big-Data Sharing System". [C]
ICC'2022 *Proceedings of IEEE International Conference on Communications (ICC'2022)*. Seoul, South Korea // Hybrid: In-Person and Virtual Conferenc. May 16 - May 20, 2022. [CCF-C]
- [4] **Shan Wang**, Ming Yang, Bryan Pearson, Tingjian Ge, Xinwen Fu, Wei Zhao.
Blockchain "On Security of Proof-of-Policy (PoP) in the Execute-Order-Validate Blockchain Paradigm". [C]
CNS'2022 *Proceedings of IEEE Conference on Communications and Network Security (CNS'2022)*. Austin, TX, USA // Hybrid: In-Person and Virtual Conference. October 3 - October 5, 2022. [43 out of 122]
- [3] **Shan Wang**, Ming Yang, Yue Zhang, Yan Luo, Tingjian Ge, Xinwen Fu, Wei Zhao.
Blockchain "On Private Data Collection of Hyperledger Fabric". [C]
ICDCS'2021 *Proceedings of the 41st IEEE International Conference on Distributed Computing Systems (ICDCS'2021)*. Virtual Conference. July 7 - July 10, 2021. [CCF-B] [AR 19.8%, 97 out of 489]
- [2] Michael Cash, **Shan Wang**, Bryan Pearson, Qun Zhou, Xinwen Fu.
CPS "On Automating BACnet Device Discovery and Property Identification". [C]
ICC'2021 *Proceedings of IEEE International Conference on Communications (ICC'2021)*. Virtual // Montreal. June 14 - June 23, 2021. [CCF-C]
- [1] Ming Yang, **Shan Wang**, Zhen Ling, Yaowen Liu, and Zhenyu Ni.
Android "Detection of Malicious Behavior in Android Apps through API Calls and Permission Uses Analysis". [J]
CCPE'2017 *Concurrency and Computation: Practice and Experience. No. 19 (2017): e4172*. [CCF-C]

Patents

- [1] Ming Yang, **Shan Wang**, Jianan Wu, Wenjia Wu, Zhen Ling. "An Applications Identification Method based on HTTP Network Packets". No.ZL201810670461.8. November 02, 2021.

Projects

- 2023.05 - Present The Hong Kong Polytechnic University - Sun Hung Kai Properties Limited (Collaborative). "DM-BIM: A Blockchain-based Platform for Decentralized Management of Building Information Models". 2023.03 - 2025.03. HKD 1000W.
Lead the team in the development of a blockchain-based BIM (Building Information Models) approval system

- 2020.02 - 2021.08 U.S. National Science Foundation. "SECTOR: Building a Secure and Compliant Cyberinfrastructure for Translational Research". 2017.09 – 2022.08. Grants No.1738965. USD 99.97W.
Developed a permissioned blockchain system and smart contracts to build the chain of custody of the shared biomedical data in an immutable ledger
- 2018.09 - 2019.08 National Natural Science Foundation of China. "Network Entities Identification Techniques based on Fingerprinting Attacks". 2016. 01 – 2019.12. Grants No.61572130. RMB 78W.
Fingerprinted Android Apps through a static analysis tool named FlowDroid, and identified Android Apps from network traffic

Research Mentoring

- 2022.05 - Present Wenxuan Dai, Master Student, Southeast University. **De-anonymizing Ethereum Users.**
De-anonymizing RPC Users in Ethereum based on network features
- 2021.10 - 2023.06 Jian Ren, Master Student, Southeast University. **Blockchain Scalability.**
Utilizing the permissioned blockchain to scale the public blockchain, and further implementing an efficient and practical digital goods fair exchange application

Professional Services

- TPC Member IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2024
IEEE International Conference on Mobility, Sensing and Networking (MSN), Track of Security, Privacy, Trust and Blockchain, 2023 (Reviewed 5 papers)
- Reviewer IEEE Internet of Things Journal (IoT-J), 2019-2023 (Reviewed over 60 papers)
IEEE Transactions on Mobile Computing (TMC), 2023
IEEE Transactions on Wireless Communications (TWC), 2023
ACM Computing Surveys (CSUR), 2023
Elsevier Journal of Systems Architecture: Embedded Software Design (JSA), 2023
IEEE Transactions on Green Communications and Networking (TGCN), 2023
- Sub-Reviewer IEEE International Conference on Computer Communications (INFOCOM), 2022-2024 (Reviewed 5 papers)
IEEE International Conference on Distributed Computing Systems (ICDCS), 2021-2023 (Reviewed 5 papers)
IEEE International Conference on Communications and Network Security (CNS), 2020-2023 (Reviewed 9 papers)
EAI International Conference on Security and Privacy in Communication Networks (SecureComm), 2023 (Reviewed 4 papers)
IEEE International Conference on Blockchain (Blockchain), 2023
IEEE Conference on Dependable and Secure Computing (DSC), 2023
IEEE Military Communications Conference (MILCOM), 2022, (Reviewed 2 papers)
International Conference on Science of Cyber Security (SciSec), 2021
- External Reviewer EuroS&P 2024, TIFS 2023, ToN 2022, WASA 2022, TDSC 2021, ICPADS 2021, CCPE 2021, CSCWD 2018

Presentations and Invited Talks

- January 2023 On Data Security in Permissioned Blockchains. Dept. of Computer Science, Virginia Tech
- January 2023 On Security of Permissioned Blockchains. FSSL Lab at Syracuse University
- October 2022 On Security of Proof-of-Policy (PoP) in the Execute-Order-Validate Blockchain Paradigm. Proceedings of CNS'2022
- May 2022 BBS: A Blockchain Big-Data Sharing System. Proceedings of ICC'2022

Awards and Honors

- 2022 China Academy of Information and Communications Technology. The 2nd China Blockchain Security Competition. The Third Place. **20,000 RMB**.
- *DoS attacks against Enterprise Ethereum and Hyperledger Fabric*
- 2021 China Academy of Information and Communications Technology. The 1st China Blockchain Security Competition. The Third Place. **20,000 RMB**.
- *Private data leakage issues in Hyperledger Fabric*
- 2019 – 2021 Southeast University (SEU) Education Foundation. Scholarship for Joint Ph.D. Program. **120,000 RMB**. [One of 20 Recipients in SEU]
- 2019 – 2021 China Scholarship Council (CSC). Scholarship for Joint Ph.D. Program. **48,000 USD**.
- 2018 National Scholarship for Ph.D. Student in Cyber Security. **50,000 RMB**. [One of 73 Recipients in China]
- 2018 Southeast University. Excellent Student Cadre.
- 2017 Southeast University. The First Class Academic Scholarship. **10,000 RMB**.
- 2013 – 2016 Southeast University (SEU) Education Foundation. Xianzi Zeng Scholarship. **15,000 RMB**.

Expertise and Skills

Blockchain	Hyperledger Fabric, Enterprise Ethereum, Ethereum, Bitcoin
Development	Modified Hyperledger Fabric source code and Docker container images; Built a big-data sharing blockchain system (both frontend and backend); Developed pairing-based cryptography scheme and threshold cryptography scheme;
Programming	Golang, Circom Solidity, Node.js, C++, Python, C, Java
Tools	Docker, Remix, CouchDB, Git

References

Dr. Jiannong Cao, Professor, IEEE Fellow

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Dr. Xinwen Fu, Professor

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🔗 <https://www.cs.uml.edu/~xinwenfu/index.html>

Dr. Tingjian Ge, Professor

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🔗 <http://www.cs.uml.edu/~ge/>

Dr. Ming Yang, Professor

Dept. of Computer Science and Engineering, Southeast University, China
yangming2002@seu.edu.cn

🔗 <https://cse.seu.edu.cn/2019/0103/c23024a257235/page.htm>

Dr. Zhen Ling, Professor

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🔗 <https://cse.seu.edu.cn/2019/0105/c23024a257511/page.htm>

Dr. Yue Zhang, Assistant Professor

Dept. of Computer Science, Drexel University, USA

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🔗 <https://yue.zyueinfosec.com/page>