

Shan Wang

Postdoctoral Fellow
Department of Computing
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🔗 Homepage

Research Interests

Blockchain, Android Security, Smart Building 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.
- 2021.09 - 2023.05 Research Assistant, Department of Computer Science, University of Massachusetts, Lowell, MA, USA. Advisor: Prof. Xinwen Fu

Education Background

- 2019.09 - 2021.09 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

Conference Publications

- [8] **Shan Wang**, Ming Yang, Wenxuan Dai, Yu Liu, Yue Zhang, Xinwen Fu.
Blockchain "Deanonymizing Ethereum Users behind Third-Party RPC Services".
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]
- [7] Shan Jiang, Jiannong Cao, Cheung Leong Tung, Yuqin Wang, **Shan Wang**.
Blockchain "Sharon: Secure and Efficient Cross-shard Transaction Processing via Shard Rotation".
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]
- [6] **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".
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]

- [5] **Shan Wang**, Ming Yang, Tingjian Ge, Yan Luo, Xinwen Fu.
Blockchain **"BBS: A Blockchain Big-Data Sharing System"**.
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, Yue Zhang, Yan Luo, Tingjian Ge, Xinwen Fu, Wei Zhao.
Blockchain **"On Private Data Collection of Hyperledger Fabric"**.
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]
- [3] **Shan Wang**, Zhen Ling, Yue Zhang, Ruizhao Liu, Joshua Kraunelisk, Kang Jia, Bryan Pearson, and Xinwen Fu.
Android **"Implication of Animation on Android Security"**.
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]
- [2] Michael Cash, Christopher Morales-Gonzalez, **Shan Wang**, Xipeng Jin, Alex Parlato, Jason Zhu, Qun Zhou Sun, Xinwen Fu.
Smart Building **"On False Data Injection Attack against Building Automation Systems"**.
ICNC'2023 *Proceedings of International Conference on Computing, Networking and Communications (ICNC'2023)*. Honolulu, Hawaii, USA. February 20 - February 22, 2023.
- [1] Michael Cash, **Shan Wang**, Bryan Pearson, Qun Zhou, Xinwen Fu.
Smart Building **"On Automating BACnet Device Discovery and Property Identification"**.
ICC'2021 *Proceedings of IEEE International Conference on Communications (ICC'2021)*. Virtual // Montreal. June 14 - June 23, 2021. [CCF-C]

Journal Publications

- [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"**.
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 Sun Hung Kai Properties Limited - The Hong Kong Polytechnic University (Collaborative). "DM-BIM: A Blockchain-based Platform for Decentralized Management of Building Information Models". 2023.03 - 2025.03. HKD 500w.
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. Under grants No.1738965.
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. Under grants No.61572130.

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-anonymization 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 50 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
- Sub-Reviewer IEEE International Conference on Computer Communications (INFOCOM), 2022-2023 (Reviewed 3 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 The 9th IEEE European Symposium on Security and Privacy (EuroS&P), 2024
IEEE International Conference on Computer Communications (INFOCOM), 2024, (Reviewed 2 papers)
IEEE Transactions on Information Forensics and Security (TIFS), 2023, (Reviewed 2 papers)
IEEE/ACM Transactions on Networking (ToN), 2022
International Conference on Wireless Algorithms, Systems, and Applications (WASA), 2022
IEEE Transactions on Dependable and Secure Computing (TDSC), 2021
IEEE International Conference on Parallel and Distributed Systems (ICPADS), 2021
Concurrency and Computation: Practice and Experience (CCPE), 2021
IEEE International Conference on Computer Supported Cooperative Work in Design (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
- July 2021 On Private Data Collection of Hyperledger Fabric. Proceedings of ICDCS'2021

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, Solidity, Node.js, C++, Python, C, Java
- Tools Docker, Remix, CouchDB, Git

References

Dr. Jiannong Cao, Professor

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 <https://www4.comp.polyu.edu.hk/~csjcao/>

Dr. Xinwen Fu, Professor

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Dr. Tingjian Ge, Professor

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Dr. Ming Yang, Professor

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

Dr. Yue Zhang, Assistant Professor

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