Jie Xu

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Research Interests

- **The future network**: Blockchain, 5G, ICN, SDN, Mobility management
- **IoT security and privacy preservations**: Smart healthcare, Smart grid, Cloud Security, etc.
- **Network security protocol design and analysis**
- **Applied cryptography**

Education

University of Science and Technology of China (USTC) *Sep. 2017 - now*
MSc in communication and information system
Information Network Laboratory (InfoNet), Xue Group
Advisor: professor Peiling Hong and associate professor Kaiping Xue

University of Science and Technology of China (USTC) *Sep. 2013 - Jul. 2017*
BS in Information Security (major), GPA:3.46/4.30.
B.S. in Science and Technology Communication (minor)

Publications and Patents

- Jie Xu, Kaiping Xue, Shaohua Li, Jianan Hong, Peilin Hong, and Nenghai Yu "Healthchain: A Blockchain-based Privacy Preserving Scheme for Large-scale Health Data," IEEE Internet of Things Journal, vol. 6,no. 5, pp. 8770-8781, 2019. (Full paper)
- Jie Xu, Kaiping Xue, Qingyou Yang, and Peilin Hong, "PSAP: Pseudonym-based secure authentication protocol for NFC applications," IEEE Transactions on Consumer Electronics, vol. 64,no. 1, pp. 83-91, 2018. (Full paper)
- Qingyou Yang, Kaiping Xue, Jie Xu, Jiajie Wang, Fenghua Li, and Nenghai Yu, "AnFRA: Anonymous and Fast Roaming Authentication for Space Information Network," IEEE Transactions on Information Forensics and Security, vol. 14, no. 2, pp. 486-497, 2019. (Full paper)
- Peixuan He, Kaiping Xue, Jie Xu, Qiudong Xia, Jianqing Liu, Hao Yue, "Attribute-based Accountable Access Control for Multimedia Content with In-network Caching," In Proc. of 2019 IEEE International Conference on Multimedia and Expo (ICME 2019). (Full paper)
- Wei Meng, Kaiping Xue, Jie Xu, Jianan Hong, and Nenghai Yu, "Low-Latency Authentication Against Satellite Compromising for Space Information Network," in Proceeding of the 15th IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS2018). IEEE, 2018, pp. 237-244. (Best paper Runner-up Award)
- Kaiping Xue, Yongjin Ma, Jianan Hong, Jie Xu, Qingyou Yang, "Secure and efficient token based roaming authentication scheme for space-earth integration network," Journal on Communications, vol. 39, no. 5, pp. 48-58, 2018. (Full paper)
- Patent: "Anonymous and Fast Roaming Authentication for Space Information Network" (Details)

Professional Experience

Blockchain *Mar. 2018 - now*
- **Project: Future Network Architecture and Protocol Evolution**

· Proposed Healthchain, a large-scale health data privacy preserving scheme, where health data are encrypted to conduct fine-grained access control.
· Proposed a self-sovereign identity authentication scheme based on blockchain, which implements efficient and fine-grained user revocation.
· Proposed a distributed cryptocurrency trading scheme to solve the problem of centralized exchanges. Deployed our scheme on the Ethereum test network and analyze the cost of the contract deployment and operation.

The next generation network *Dec. 2016 - Feb. 2018*

· **Project: Information Security Technology for Space-Air-Ground Integration Network**
· Learned user access control and mobility management in 3GPP 5G
· Gave a new authentication system model of the Space Information Network, and proposed a secure and efficient access authentication scheme.
· Strengthened the authentication function of LEO satellites, and proposed a two-way token based roaming authentication scheme and a fast roaming authentication scheme.

Network security protocol design *Apr. 2016 - May. 2017*

· **Project: Lightweight class remote technology and method on data link layer**
· Constructed a remote low-power wireless information collection platform based on long-distance communication chips SX1278.
· Designed a data link layer protocol for self-organizing modules to reduce energy consumption.
· Implemented an APP to allow the user to control the sensor node to collect data.

IoT network security *Sep. 2015 - Oct. 2016*

· **Project: Research on Secure and Reliable Control Mechanism of Household Intelligent Devices**
· Proposed a scheme in which the home data is encrypted and transmitted to the cloud storage, and the mobile terminal can control the smart home device at the same time.
· Designed a secure authentication and key agreement protocol for preserving privacy in NFC and gave the formal security verification using AVISPA tool and formal security analysis using ROR model.

Other Experience

· Teaching Assistant, Computer Network, USTC, 2018
· President of the Association of Jun Xing, 2017

Honors and Awards

· National Scholarship for Graduate Students (top 1%, national, 2019)
· Best Paper Runner Up Award of IEEE MASS 2018
· Excellent Graduation Thesis of USTC 2017
· Honor of "Wang Daheng Talent Program in Optical and mech-electronical Science and Technology", 2016
· Outstanding Students Award of USTC 2015,2016
· Excellent Team Award of USTC 2015

Skills and Hobby

· Programming Language: C, Python, JAVA, 8086 Assembly Language
· Hobby: Playing Guzheng (Chinese national musical instrument, Level 10, the highest level of non-professional)