Fangyu Gai

Curriculum Vitae

✆ +1 2508993406
✉ fangyu.gai@ubc.ca
🖱 https://fangyugai.me/
🐦 greferry
⌨ gitferry
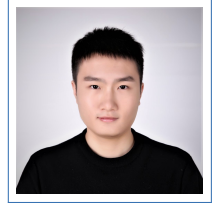
Educational Background

2018
Ph.D., *University of British Columbia*, Vancouver and Kelowna, Canada, research on the general area of blockchain technology, mainly focusing on layer-2 scaling of blockchain systems.

2015
2017
Master of Engineering, *National University of Defense Technology*, Changsha, China, major in Computer Science and Technology.
Thesis: Research on Trust Management for Internet of Things

2011
2015
Bachelor of Science, *Beijing Institute of Technology*, Beijing, China, major in Information Security.
Thesis: Enhance Adaboost Algorithm by Integrating LDA Topic Model

Research Interests

- Distributed Systems
- Blockchain & Smartcontract
- IoT Security and Privacy

Research Experience

2018
Research and implementation on Layer 2 scaling of blockchain systems.

Role Group leader.

Description Scaling remains the primary focus of current development of blockchain. Layer 2 solutions including Plasma, TrueBit and StateChannel provide "off-chain" solutions. Current research is based on Plasma framework, addressing remaining issues.

Project website `https://github.com/gitferry/mastering-ethereum`

2017
Research and implementation on reputation-based consensus protocol.

Role Group leader.

Description Beyond cryptocurrencies, it is believed that blockchain can also be used to protect other properties such as reputation. This project presents a reputation-based consensus protocol called Proof of Reputation (PoR), which guarantees reliability and integrity of transaction outcomes.

Funding Agency National Science Foundation of China (NSFC).

Project website   `https://github.com/gitferry/PoR`

2016

Research on Blockchain based Identity Authentication and data protection for Internet of Things.

Role   Group leader.

Description   IoT suffers from potential systemic failures as it scales with disastrous consequences. This project proposes an integrated blockchain and IoT hardware solution to solve IoT's issues with identity, security, and interoperability.

Funding Agency   State Scientific and Technological Commission.

2015
2017

The Security Model and Mechanism of Massive CPSNet (Cyber-Physical-Social Network) towards Critical Infrastructures.

Role   Core member.

Description   In large-scale complex networks, attacks can be launched from cyber, physical and social domains. This project studies the cross-domain spreading of threats and aims to implement a multi-domain distributed collaborative IDS by semantic analysis.

Funding Agency   National Science Foundation of China (NSFC).

Working Experience

Internship

2014

Software Designer Internship, *JoyShare Inc.*, Beijing, China.
Developed an iOS App named JoyShare, which helps users share their goods online.

Teaching Assistant

2019 **ENGR 435 Internet of Things**, *University of British Columbia*, Kelowna, Canada.
SUPERVISOR Professor Chen Feng

2016 **Cryptography**, *National University of Defense Technology*, Changsha, China.
SUPERVISOR Professor Xinwen Jiang

Open Source Contributor

2018 **Solidity Document Translation**, *HiBlock Inc.*, Beijing, China.
Working as a member of Chinese Solidity document translation team, which is authorized by Solidity team.

Languages

Chinese   **Native**   *Mother Tongue*

English   **IELTS 7.0**   *Listening: 7.5, Reading: 8.0, Writing: 6.0, Speaking: 7.0*

Japanese   **Basic Fluency**   *Good Understanding, Medium Speaking, Basic Writing*

Skills

Programming	**Soldity, Python, Go, Objective-C, Javascript, LaTeX**
Tools	**GitHub, PyCharm, BitBucket, Vim, Docker** *Program Version Control and Program Repositories.*
Other Skills	**Communication, Organization, Writing, Translation**

Participation In Events

2015

The 3rd Kcon, Beijing, China.
A well known hacker meeting in China.

2017

The 12th International Conference on Wireless Algorithms, Systems, and Applications, *as a speaker*, Guilin, China.
An academic conference focusing on ubiquitous infrastructure and infrastructureless wireless networks.

2017

The 5th Internet Security Conference, Beijing, China.
The largest Asia-pacific security event with the highest level and widest influence.

2017

Google Developer Dyas, Beijing, China.

Publications

[Gai et al., 2016]   Gai, F., Li, Z., Jiang, X., and Guo, H. (2016). Enhance adaboost algorithm by integrating lda topic model. In *International Conference on Data Mining and Big Data*, pages 27–37. Springer.

[Gai et al., 2018]   Gai, F., Wang, B., Deng, W., and Peng, W. (2018). Proof of reputation: A reputation-based consensus protocol for peer-to-peer network.

[Gai et al., 2017a]   Gai, F., Zhang, J., Zhu, P., and Jiang, X. (2017a). Multidimensional trust-based anomaly detection system in internet of things. In *International Conference on Wireless Algorithms, Systems, and Applications*, pages 302–313. Springer.

[Gai et al., 2017b]   Gai, F., Zhang, J., Zhu, P., and Jiang, X. (2017b). Ratee-based trust management system for internet of vehicles. In *International Conference on Wireless Algorithms, Systems, and Applications*, pages 344–355. Springer.

[Gai et al., 2017c]   Gai, F., Zhang, J., Zhu, P., and Jiang, X. (2017c). Trust on the ratee: A trust management system for social internet of vehicles.

[Li et al., 2018]   Li, D., Peng, W., Deng, W., and Gai, F. (2018). A blockchain-based authentication and security mechanism for iot. In *27th International Conference on Computer Communication and Networks, ICCCN 2018, Hangzhou, China, July 30 - August 2, 2018*, pages 1–6.

[Liu et al., 2018]   Liu, D., Wang, J., Rong, Z., Mi, X., Gai, F., Tang, Y., and Wang, B. (2018). Pangr: A behavior-based automatic vulnerability detection and exploitation framework. In *17th IEEE International Conference On Trust, Security And Privacy In Computing And Communications / 12th IEEE International Conference On Big Data Science And Engineering, TrustCom/BigDataSE 2018, New York, NY, USA, August 1-3, 2018*, pages 705–712.