

# Changming Liu

PhD Candidate, Northeastern University, Boston, MA

## Contact Information

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**Google Scholar:** <https://scholar.google.com/citations?user=DBc2YBoAAAAJ>

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## Education

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### Northeastern University

PhD student of Cybersecurity in Khoury College of Computer Science

Advised by Prof Long Lu and Prof Engin Kirda

Boston, USA

Sept 2019 - Now

### Huazhong University of Sci & Tech

M.Eng student of Computer Architecture in School of Computer Sci & Tech

Advised by Prof Hai Jin

Wuhan, China

Sept 2016 - June 2019

### Huazhong University of Sci & Tech

B.Eng student of Information Security in School of Computer Sci & Tech

Advised by Prof Deqing Zou

Wuhan, China

Sept 2012 - June 2016

## Publications

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- Zhichuang Sun, Runmin Sun, Changming Liu, Chowdhury Amrita Roy, Somesh Jha and Long Lu. 2023. **ShadowNet: A Secure and Efficient System for On-device Model Inference**. Oakland 2023 to appear, <https://arxiv.org/abs/2011.05905>.
- Changming Liu, Xiaojing Ma, Sixing Cao, Jiayun Fu, and Bin B. Zhu. 2022. **Privacy-preserving Motion Detection for HEVC-compressed Surveillance Video**. ACM Trans. Multimedia Comput. Commun. Appl. 18, 1, Article 23 (January 2022), 27 pages.
- Changming Liu, Yaohui Chen, and Long Lu. 2021. **KUBO: Precise and Scalable Detection of User-triggerable Undefined Behavior Bugs in OS Kernel**. In Proceedings of the 28th Network and Distributed System Security Symposium(NDSS 2021), Virtual Conference, 21st February - 25th February 2021.
- Peng Luo, Deqing Zou, Yajuan Du, Hai Jin, Changming Liu, and Jinan Shen. 2020. **Static detection of real-world buffer overflow induced by loop**. Computers & Security, Volume 89, 2020, 101616, ISSN 0167-4048.
- Changming Liu, Deqing Zou, Peng Luo, Bin B. Zhu, and Hai Jin. 2018. **A Heuristic Framework to Detect Concurrency Vulnerabilities**. In Proceedings of the 34th Annual Computer Security Applications Conference (ACSAC '18). Association for Computing Machinery, New York, NY, USA, 529–541
- Xiaojing Ma, Changming Liu, Sixing Cao, and Bin B. Zhu. 2018. **JPEG Decompression in the Homomorphic Encryption Domain**. In Proceedings of the 26th ACM international conference on Multimedia (MM '18). Association for Computing Machinery, New York, NY, USA, 905–913.
- Liu Changming, Fu Cai, Xu Deliang, Sun Lin, Han Lansheng. 2015. **An Energy-Balanced WSN Algorithm Based on Active Hibernation and Data Recovery**. In Proceedings of Algorithms and Architectures for Parallel Processing. ICA3PP 2015. Lecture Notes in Computer Science, vol 9528. Springer, Cham.

## Under submission

- Changming Liu, Alejandro Mera, Engin Kirda, Long Lu. **SPEAR: On-device Symbolic Execution for Embedded Applications.**
- Alejandro Mera, Changming Liu, Ruimin Sun, Engin Kirda, Long Lu **SHiFT: Semi-hosted Fuzz Testing for Embedded Applications.**
- Bo Feng, Meng Luo, Changming Liu, Long Lu, Engin Kirda **AIM: Automatic Interrupt Modeling for Dynamic Firmware Analysis.**

## Experience

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### Research Assistant

Sept 2019 - Now

Advisor: Prof. Long Lu and Prof Engin Kirda

Khoury College of Computer Science, Northeastern University, Boston MA, USA

### Research Intern

May 2021 - Aug 2021

Mentor: Dr. Kapil Singh

T.J. Watson Research Center, IBM Information Security Research, Yorktown Heights, NY, USA

- Building infrastructure for cloud services to automatically infer the microservices' identities and establish trust.

### Research Intern

Sept 2018 - March 2019

Mentor: Dr. Bin.B.Zhu

Software analytics group, Microsoft Research Asia, Beijing, China

- Designing and implementing scalable fuzzing approach for concurrency bugs.

### Research Intern

Sept 2018 - March 2019

Mentor: Dr. Bin.B.Zhu

Software analytics group, Microsoft Research Asia, Beijing, China

- Integrating deep learning-based object detection framework into outlook's anti-phishing system.

### Research Assistant

July 2015 - Sept 2015

Advisor: Prof. S.M.Yiu

Computer Science Department, University of Hong Kong, Hong Kong, China

- Research paper reading and implementation about privacy-preserving genome applications.

## Honors & Awards

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Excellent Intern Award(Top 20%)

Microsoft Research Asia, 2019

National Scholarship

Ministry of Education of China, 2018

Excellent Intern Award(Top 20%)

Microsoft Research Asia, 2018

Graduate with honor

Huazhong University of Sci & Tech, 2016

Merit Student

Huazhong University of Sci & Tech, 2015

National Scholarship

Ministry of Education of China, 2015

## Misc

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### Talks:

Presentation in ACM MM'18; Talk in Korea University(Oct, 2018)

### Programming:

Python(practiced);C/C++(practiced);Ocaml(familiar);Java(Basic);

### Hobbies:

Badminton and violin.

### Bug Hunt:

Find 14 new undefined behaviors bugs in the Linux kernel that are either acknowledged or patched.