Changming Liu

Software Engineer, Google, Sunnyvale, CA

Contact Information

Google Scholar: https://scholar.google.com/citations?user=DBc2YBoAAAAJ **Phone:** +1-617-637-6223
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Education

PhD of Cybersecurity, advised by Prof Engin Kirda 2019/09 - 2024/10
Khoury College of Computer Science, Northeastern University Boston, MA, USA

M.Eng of Computer Architecture, advised by Prof Hai Jin 2016/09 - 2019/06
School of Computer Sci & Tech, Huazhong University of Sci & Tech Wuhan, China

B.Eng of Information Security, advised by Prof Deqing Zou 2012/09 - 2016/06
School of Computer Sci & Tech, Huazhong University of Sci & Tech Wuhan, China

Experience

Software Engineer 2024/12 - Now
Accelerator Security, Google Cloud Sunnyvale, CA, USA
- Integrating confidential computing into accelerator products.
- Facilitating faster integration of experimental accelerators.

Research Intern 2021/05 - 2021/08
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 2017/09 - 2018/03, 2018/09 - 2019/03
Software analytics group, Microsoft Research Asia Beijing, China
- Designing and implementing fuzz testing algorithm to detect concurrency bugs.
- Integrating deep-learning-based object detection framework into outlook's anti-phishing system.

Research Assistant 2015/07 - 2015/09
Computer Science Department, University of Hong Kong Hong Kong SAR, China
- Research paper reading and implementation about privacy-preserving genome applications.

Publications

Accepted:

- Changming Liu, Alejandro Mera, Engin Kirda, Meng Xu, Long Lu. **CO3: Concolic Co-execution for Firmware**. In proceedings of the 33rd USENIX Security Symposium (USENIX Security 24).
- Alejandro Mera, Changming Liu, Ruimin Sun, Engin Kirda, Long Lu **SHiFT: Semi-hosted Fuzz Testing for Embedded Applications**. In proceedings of the 33rd USENIX Security Symposium (USENIX Security 24).
- Bo Feng, Meng Luo, Changming Liu, Long Lu and Engin Kirda, **AIM: Automatic Interrupt Modeling for Dynamic Firmware Analysis** in IEEE Transactions on Dependable and Secure Computing, doi: 10.1109/TDSC.2023.3339569.

- 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** in 2023 IEEE Symposium on Security and Privacy (SP), San Francisco, CA, USA, 2023 pp. 1596-1612.
- 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, Meng Xu. **DRIFT: Debug-based Trace Inference for Firmware Testing**.

Honors & Awards

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

Reviewership:	Journal of Systems Architecture; Usenix Sec AE 2025; NDSS 2021 (External); CCS 2021 (External)
Programming:	C/C++;Python;
Hobbies:	Badminton and violin.
Bug Hunt:	Find 14 new undefined behaviors bugs in the Linux kernel that are either acknowledged or patched.