

# Lei XUE (薛磊)

Research Assistant Professor, Ph.D. Supervisor

Department of Computing, The Hong Kong Polytechnic University

✉ leixue@comp.polyu.edu.hk

🏠 Room PQ810, Mong Man Wai Building

☎ (852) 2766 7334

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

🆔 <https://orcid.org/0000-0001-5321-5740>

## Employment History

- 2020.04 – Now     📖 **Research Assistant Professor**  
Department of Computing, The Hong Kong Polytechnic University.
- 2017.12 – 2020.03     📖 **Postdoc Research Fellow**  
Department of Computing, The Hong Kong Polytechnic University.

## Education

- 2013.07 – 2017.10     📖 **Ph.D.** in Computer Science, The Hong Kong Polytechnic University.  
Thesis title: *Cross-layer Dynamic Analysis of Android Applications*
- 2010.06 – 2013.04     📖 **M.S.** in Information Security, Nanjing University of Posts and Telecommunications.  
Thesis title: *Trojan Detection Based on Network Behaviors*
- 2006.09 – 2010.06     📖 **B.S.** in Information Security, Nanjing University of Posts and Telecommunications.  
Thesis title: *Active Forensic System Based on Honeypot Technology*

## Research Interests

- 📖 Mobile Application/System and IoT Security
- 📖 Automotive Security and Autonomous Driving Security
- 📖 Static and Dynamic Program Analysis
- 📖 System and Software Vulnerability/Bug Detection
- 📖 Network Security and Measurement

## Research Publications

(# indicates co-first author)

- 1 **Lei Xue**, Yuxiao Yan, Luyi Yan, Muhui Jiang, Xiapu Luo, Dinghao Wu, and Yajin Zhou, “Demystifying VM-based Packers for Android Apps,” in Proc. of 30th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), 2021, conditionally accepted. (*CCF-A, Top software engineering conference*)

- 2 **Lei Xue**<sup>#</sup>, Hao Zhou<sup>#</sup>, Xiapu Luo, Yajin Zhou, Yang Shi, Guofei Gu, Fengwei Zhang, and Man Ho Au, “Happer: Unpacking Android Apps via a Hardware-Assisted Approach,” in Proc. of 42nd IEEE Symposium on Security and Privacy (IEEE S&P), 2021. *(CCF-A, Top-4 Security Conference)*
- 3 **Lei Xue**, Hao Zhou, Xiapu Luo, Le Yu, Dinghao Wu, Yajin Zhou, and Xiaobo Ma, “PackerGrind: An Adaptive Unpacking System for Android Apps,” IEEE Transactions on Software Engineering (TSE), 2020. *(CCF-A, JCR-Q1)*
- 4 Qiao Kang<sup>#</sup>, **Lei Xue**<sup>#</sup>, Adam Morrison<sup>#</sup>, Yuxin Tang, Ang Chen, and Xiapu Luo, “Programmable In-Network Security for Context-aware BYOD Policies,” in Proc. of the 29th USENIX Security Symposium (USENIX Security), 2020. *(CCF-A, Top-4 security conference)*
- 5 **Lei Xue**, Chenxiong Qian, Hao Zhou, Xiapu Luo, Yajin Zhou, Yuru Shao, and Alvin T.S. Chan, “NDroid: Towards Tracking Information Flows across Multiple Android Contexts,” IEEE Transactions on Information Forensics and Security (TIFS), 2019. *(CCF-A, JCR-Q1)*
- 6 Adam Morrison<sup>#</sup>, **Lei Xue**<sup>#</sup>, Ang Chen, and Xiapu Luo, “Enforcing Context-Aware BYOD Policies with In-Network Security,” in Proc. of USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), 2018.
- 7 **Lei Xue**, Xiaobo Ma, Xiapu Luo, Edmond W.W. Chan, Tony T.N. Miu, and Guofei Gu, “LinkScope: Towards Detecting Target Link Flooding Attacks,” IEEE Transactions on Information Forensics and Security (TIFS), 2018. *(CCF-A, JCR-Q1)*
- 8 **Lei Xue**, Yajin Zhou, Ting Chen, Xiapu Luo, and Guofei Gu, “Malton: Towards On-Device Non-Invasive Mobile Malware Analysis for ART,” in Proc. of the 26th USENIX Security Symposium (USENIX Security), 2017. *(CCF-A, Top-4 security conference)*
- 9 **Lei Xue**, Xiapu Luo, Le Yu, Shuai Wang, and Dinghao Wu, “Adaptive Unpacking of Android Apps,” in Proc. of 39th International Conference on Software Engineering (ICSE), 2017. *(CCF-A, Top software engineering conference)*
- 10 **Lei Xue**, Xiaobo Ma, Xiapu Luo, Le Yu, Shuai Wang, and Ting Chen, “Is What You Measure What You Expect? Factors Affecting Smartphone-Based Mobile Network Measurement,” in Proc. of IEEE International Conference on Computer Communications (INFOCOM), 2017. *(CCF-A)*
- 11 **Lei Xue**, Chenxiong Qian, and Xiapu Luo, “AndroidPerf: A Cross-layer Dynamic Profiling System for Android,” in Proc. of IEEE/ACM International Symposium on Quality of Service (IWQoS), 2015. *(CCF-B)*
- 12 **Lei Xue**, and Guozi Sun, “Design and Implementation of A Malware Detection System Based on Network Behavior,” Security and Communication Networks (SCN), 2015. *(CCF-C)*
- 13 **Lei Xue**, Xiapu Luo, Edmond W. W. Chan, and Xian Zhan, “Towards Detecting Target Link Flooding Attack,” in Proc. of 28th USENIX Large Installation System Administration Conference (LISA), 2014. *(CCF-B)*
- 14 Xiapu Luo, **Lei Xue**, Cong Shi, Yuru Shao, Chenxiong Qian, and Edmond W. W. Chan, “On Measuring One-Way Path Metrics from a Web Serve,” in Proc. of IEEE International Conference on Network Protocols (ICNP), 2014. *(CCF-B)*
- 15 **Lei Xue**, Xiapu Luo, and Yuru Shao, “kTRxer: A portable toolkit for reliable internet probing,” in Proc. of IEEE/ACM International Symposium on Quality of Service (IWQoS), 2014. *(CCF-B)*

- 16 **Lei Xue**, Ricky K. P. Mok, and Rocky K. C. Chang, “OMware: an open measurement ware for stable residential broadband measurement (poster),” in Proc. of Proceedings of ACM Special Interest Group on Data Communication (SIGCOMM), 2013.
- 17 Pengfei Jing, Qiyi Tang, Yuefeng Du, **Lei Xue**, Xiapu Luo, Ting Wang, Sen Nie, and Shi Wu, “Too Good to Be Safe: Tricking Lane Detection in Autonomous Driving with Crafted Perturbations,” in Proc. of the 30th USENIX Security Symposium (USENIX Security), 2021. *(CCF-A, Top-4 security conference)*
- 18 Hao Zhou, Haoyu Wang, Yajin Zhou, Xiapu Luo, Yutian Tang, **Lei Xue**, and Ting Wang, “Demystifying Diehard Android Apps,” in Proc. of the 35th IEEE/ACM International Conference on Automated Software Engineering (ASE), 2020. *(CCF-A, Top software engineering conference)*
- 19 Jiali Wei, Ming Fan, Xi Xu, Ang Jia, Zhou Xu, and **Lei Xue**, “Interpretation Area-Guided Detection of Adversarial Samples,” in Proc. of IEEE 20th International Conference on Software Quality, Reliability and Security Companion (QRS-C), 2020.
- 20 Xiaobo Ma, Jiahao Peng, **Lei Xue**, and Xiaohong Guan, “Integrated security of cyber-physical vehicle networked systems in the age of 5G,” SCIENTIA SINICA Informationis (SSI), 2019. *(CCF-A Chinese Journal)*
- 21 Xiaobo Ma, Bo An, Mengchen Zhao, Xiapu Luo, **Lei Xue**, Zhenhua Li, TungNgai Miu, and Xiaohong Guan, “Randomized Security Patrolling for Link Flooding Attack Detection,” IEEE Transactions on Dependable and Secure Computing (TDSC), 2019. *(CCF-A, JCR-Q1)*
- 22 Jiahao Peng, Xiaobo Ma, Jianfeng Li, **Lei Xue**, and Wenjun Hu, “Shoot at A Pigeon And Kill A Crow: On Strike Precision of Link Flooding Attacks,” in Proc. of 12th International Conference on Network and System Security (NSS), 2018.
- 23 Ting Chen, Wanyu Huang, Muhui Jiang, Xiapu Luo, **Lei Xue**, Ying Wang, and Xiaosong Zhang, “PERDICE: Towards Discovering Software Inefficiencies Leading to Cache Misses and Branch Mispredictions,” in Proc. of 42nd Annual Computer Software and Applications Conference (COMPSAC), 2018. *(CCF-C)*
- 24 Le Yu, Tao Zhang, Xiapu Luo, **Lei Xue**, and Henry Chang, “Towards Automatically Generating Privacy Policy for Android Apps,” IEEE Transactions on Information Forensics and Security (TIFS), 2017. *(CCF-A, JCR-Q1)*
- 25 Xiapu Luo, Haochen Zhou, Le Yu, **Lei Xue**, and Yi Xie, “Characterizing mobile \*-box applications,” Computer Networks (Computer Networks), 2016. *(CCF-B)*
- 26 Le Yu, Tao Zhang, Xiapu Luo, and **Lei Xue**, “AutoPPG: Towards Automatic Generation of Privacy Policy for Android Applications,” in Proc. of 6th Annual ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM), 2015.

## Patents

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- 1 Network Attack Detection Method, **Lei Xue**, Zhiwei Liu, Xianneng Zou, Jingang Hou, Xiapu Luo, Edmond W. W Chan, Pei Tu, and Yuru Shao, Patent number: US9876807B2, USA
- 2 Information Processing Method and Device, Xiapu Luo, Jingang Hou, Zhiwei Liu, Xianneng Zou, Juhong Wang, **Lei Xue**, Yajuan Tang, and Weigang Wu, Patent number: US10178204B2, USA
- 3 A Method for Detecting DDoS Attack, **Lei Xue**, Zhiwei Liu, Xianneng Zou, Jingang Hou, Xiapu Luo, Edmond W. W Chan, Pei Tu, and Yuru Shao, Publication number: CN104506482A, CN

- 4 An E-mail Forensic Analysis Method Based on Community Classification, Guozi Sun, **Lei Xue**, Yitao Yang, Xiaolong Zhu, and Rui Wang, Patent Grant number: CN102842078B, CN

## Funds

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- 1 **PI**, "Cross-component Security Assessing of Firmware Update in Appified IoT Systems," NSFC/Young Scholar Fund, RMB 240K, 2021 - 2023.
- 2 **PI**, "Technical Cooperative Research of Fuzzing for Embedded CT," Huawei, HKD 1.53M, 2021 - 2023.
- 3 **PI**, "Deep Program Synthesis Based Hardened Code Analysis," Tencent Gift Fund, HKD 173.8K, 2021 - 2021.
- 4 **PI**, "Context-aware Defense against Message Injection Attacks on In-vehicle Network," PolyU Start-up Fund, 2020 - 2022.
- 5 **Co-PI**, "Checking Privacy Compliance of Mobile Apps via Synthesizing NLP and Program Analysis," Huawei, HKD 1.42M, 2020 - 2021.

## Awards

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- Best Proposal Award (Group), Third Place of COMP, 2017
- Tencent Security Response Award, 2016
- Student Grant for ACM CCS, 2015
- Student Grant for USENIX LISA, 2014.
- The National Scholarship Award, 2012.
- The Excellent Graduate Student Award, 2012.
- The Research and Innovation Award (4 in NJUPT), 2009.

## Professional Services

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### TPC Member

- 2018: NSS
- 2019: SocialSec | SANER Blockchain Workshop | CoNEXT Student Workshop
- 2020: SocialSec | NSS
- 2021: SANER IBF Workshop | DSA | SocialSec

### Journal Reviewer (Selected)

- IEEE Transactions on Dependable and Secure Computing (TDSC)
- IEEE Transactions on Information Forensics and Security (TIFS)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Industrial Informatics (TII)
- ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)
- IEEE Communication Magazine
- Security and Communication Networks

## Teaching

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- Capstone Project (COMP4913), Spring 2021, Co-examiner
- Big Data Computing (COMP5434), Summer 2020, Summer 2021, Lecturer
- Computer Communications Networks (COMP312), Spring 2016, TA
- Distributed Computing (COMP5325), Spring 2015, TA
- Internet Security: Principles and Practice (COMP5353), Spring 2014, Spring 2015, TA
- Web Services and Project Development (COMP5332), Fall 2013, Fall 2014, TA

## Students under Supervision

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- |                 |   |
|-----------------|---|
| 2021 Feb. – Now | 📖 Luyi Yan, RA (PhD from 2021 Fall), The Hong Kong Polytechnic University.  |
|                 | 📖 Tianqi Li, RA (PhD from 2021 Fall), The Hong Kong Polytechnic University. |
|                 | 📖 Zhihao Wang, RA, The Hong Kong Polytechnic University.                    |
| 2021 Jan. – Now | 📖 Yangyang Liu, RA (MPhil from 2021 Fall), Hunan University.                |
| 2020 Jan. – Now | 📖 Yuxiao Yan, RA (Graduate), Xi'an Jiaotong University.                     |