

Xusheng Xiao

Associate Professor

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Research Interests

My research interests span the areas of **software engineering** and **computer security**, with the emphasis on AI-enhanced software and system analysis approaches that synergistically combine software analysis and artificial intelligence to improve the reliability and the security of software and computer systems. My current research has three focused areas: *Large Language Model for Software Analysis*, *Large Language Model for Cyber Threat Investigation*, *Software Testing and Analysis*, and *Blockchain System and Smart Contract Security*.

Education

- 2009–2014 **Ph.D. in Computer Science**, North Carolina State University
Visiting Student, University of Illinois at Urbana-Champaign (2013–2014)
- 2009–2011 **M.S. in Computer Science**, North Carolina State University
- 2003–2007 **B.E. in Software Engineering**, Chongqing University

Professional Experience

- 8/2022–NOW **Associate Professor**, Arizona State University (ASU), USA
- 2/2017–8/2022 **Assistant Professor**, Case Western Reserve University (CWRU), USA
- 2014–2/2017 **Researcher**, NEC Labs America, USA
- Summer 2013 **Research Intern**, Microsoft Research Redmond, USA
- Summer 2012 **Research Intern**, NEC Labs America, USA
- Fall 2011 **Research Intern**, Microsoft Research Asia, China
- Summer 2011 **Research Intern**, Microsoft Research Redmond, USA
- Summer 2010 **Research Intern**, IBM T.J. Watson Research Center, USA
- 2007–2009 **Software Developer**, ThoughtWorks, China

Honors and Awards

- 2022 Environmental Science & Technology (ES&T) Best Paper Award
- 2021 National Science Foundation (NSF) CAREER Award
- 2021 Case School of Engineering Research Award, Case Western Reserve University
- 2018 Top 10 Finalist for CSAW Best Applied Security Research Paper Award [C21]
- 2018 Samsung GRO Award
- 2018 National Science Foundation (NSF) CRII Award
- 2016 Grand Prix in the Town Life and Society Innovation Category, CEATEC Award, Japan
 - Award Link: http://www.ceatec.com/en/award/award01_02.htm#awtown
 - One of the Five Category Awards Selected from 648 Exhibiting Companies (e.g., Epson, Panasonic, Mitsubishi Electric, Toyota)
 - Press: http://jpn.nec.com/press/201610/20161005_06.html
- 2015 Top 10 Finalist for CSAW Best Applied Security Research Paper Award [C11]

- 2012 International Conference on Software Engineering (ICSE) Student Research Competition (SRC) Best Project Representing an Innovative Use of Microsoft Technology [W1, C1]
- 2011 Microsoft Research Asia Excellent Summer Internship Award
- 2011 Best Project Representing an Innovative Use of Microsoft Technology in ICSE SRC [W1, C1]
- 2011 Finalist for the Fifth Annual National Security Innovation Competition (NSIC), USA

Grants

SUMMARY OF RESEARCH SUPPORT

- Dr. Xiao's share (recognition) in all awards as PI or co-PI: \$697,944
- Dr. Xiao's share (recognition) of the total award amount received at ASU as PI or co-PI as of 09/18/2023: \$613,949
- Dr. Xiao's share (recognition) of research expenditures as of 09/18/2023: \$253,607
- Total amount of all awards in which Dr. Xiao is the PI or co-PI: \$83,995
- Total amount of all awards in which Prof Xiao is the PI: \$83,995
- Total amount of all pending proposals in which Prof Xiao is the PI or co-PI: \$ 2,694,682.78

11 awarded grants, \$4,173,769 in total, personal share: \$1,325,415

Pending Grants in ASU:

- [G16] NSF, "SaTC: CORE: Small: Revamping Security Management in Smartphone Platforms via Detecting and Explaining Risky Mobile App Behaviors", \$599,876, 2025-2026, **PI**.
- [G15] NSF, "SaTC: CORE: Small: Cyber Intelligence Guided Attack Investigation Powered by LLM and Provenance Analysis", \$599,999, 2025-2026, **PI**.
- [G14] NSF, "SHF: CORE: Small: Specification Mismatch Detection in System Emulators via LLM-Powered Specification Inference and Record and Replay-Aided Testing", \$240,000, 2025-2028, **co-PI** (total \$600,000 with **PI**: Adil Ahmad, ASU).
- [G13] DOE, "ADIME: APT Detection, Investigation, and Mitigation in Energy Systems", \$660,675.5, 2025-2029, **PI** (total \$10,000,000 with **PIs and co-PIs**: Qinghua Li, U Arkansas, Xiangyu Zhang, Purdue University, Adil Ahmad, ASU and so on).
- [G12] DARPA, "COMPOST: COMponent-based Program Optimization, Synthesis, and Transpiling", \$594132.28, 2025-2027, **Co-PI** (total \$4,243,802 with **PIs**: Fish Wang, Yan Shoshitaishvili, Tiffany Bao, Ben Zhou, and Adam Doupe, ASU).

Active Grants in ASU:

- [G11] OpenAI, Researcher Access Program, \$5,000, 2024-2025, **PI**.
- [G10] NSF, "CAREER: Enhancing Mobile Application Security through Contextual Integrity and User Awareness", \$516,000 (\$500,000 plus \$16,000 REU), 2021-2026, **PI**.
- [G9] NSF, "EAGER: Small: Enhancing Security and Privacy of Augmented Reality Mobile Applications through Software Behavior Analysis", \$150,000, 2022-2026, **PI** (total \$300,000 with **co-PIs**: Xiaoyin Wang, UTSA and Wei Wang, UTSA).
- [G8] NSF, "SaTC: CORE: Small: Scalable Cyber Attack Investigation using Declarative Queries and Interrogative Analysis", \$301,235, 2020-2026, **PI** (total \$499,979 with co-PI: Yinghui Wu, CWRU).

Past Grants in CWRU:

- [G7] DOE-ARPA-E, "Demonstration and Validation of A Virtual Energy Audit", \$37,729, 2020-2023, **co-PI** (total \$1,153,461 with PI: Roger French, CWRU).

- [G6] DOE-ARPA-E, “Materials Degradation & Lifetime Extension: Module 1”, \$71,258, 2021-2022, **co-PI** (total \$1,200,013 with PI: Roger French, CWRU).
- [G5] Nuclear Regulatory Commission, “Nuclear Regulatory Commission (NRC) Fellowship & Scholarship Program”, 2021-2022, **Senior-Personnel** (total \$212,893 with PI: Rohan Akolkar, CWRU).
- [G4] NSF, “Enhancing Mobile App Security by Detecting Icon-Behavior Contradiction”, \$190,923 (\$174,923 plus \$16,000 REU), 2018-2022, **PI**.
- [G3] Samsung, Global Research Outreach (GRO) program, “Automatic Inference of Application Reputation via PageRank on System Monitoring Data”, \$57,500, 2017-2018, **PI** (total \$100,000 with co-PI: Lingming Zhang, UT Dallas).
- [G2] CWRU, Institute for Smart, Secure and Connected Systems (ISSACS), “Automatic Attack Investigation via Weight-Aware Reputation Propagation from System Monitoring”, \$8,000, 2019, **PI**.
- [G1] CWRU, Support of Undergraduate Research and Creative Endeavors (SOURCE), “Automatic Inference of Application Reputation on System Monitoring Data”, \$3,500, 2018, **PI**.

Publications

- **Important Note:** Conference publications in computer science (CS) have attracted scholarly attention due to their unique status as a main research outlet unlike other science fields where journals are dominantly used for communicating research findings.
- **Major Associations for CS publications:**
 - **IEEE:** Institute of Electrical and Electronics Engineers
 - **ACM:** Association for Computing Machinery
 - **USENIX:** USENIX association is an American 501(c)(3) nonprofit membership organization that supports advanced computing systems and operating system (OS) research.
- **Top conference publications (Total 40):** *ICSE (8), FSE (1), ISSTA (4), ASE (5), CCS (5), USENIX Security (6), IEEE S&P (1), NDSS (2), USENIX ATC (1), ICDE (2), VLDB (1), SIGMOD (1), ICDM (1), SIGMETRICS (1), WWW (1)*
- **Google Scholar Citations: 4925**
- **DBLP:** <https://dblp.org/pid/13/9656.html>
- **Google Scholar:** <https://scholar.google.com/citations?user=qVx6V7UAAAAJ>

SUMMARY OF PUBLICATIONS AND INTELLECTUAL PROPERTY

- Book Chapters (Published, In Press, or Accepted): 1
- Total Journal Publications (Published, In Press, or Accepted): 11
 - Invited Journal Publications: 1
- Journal Publications (Published, In Press, and /or Accepted) from ASU: 2
- Journal Publications Prior to ASU (All Published): 9
- Manuscripts Submitted / In Revision from ASU: 5
- Refereed Conference Papers: 52
- Intellectual Property prior to ASU: Patents 6

Legend

- (*) Corresponding Author
- **Bold Font:** Ph.D. Students (ASU or CWRU) for whom Dr. Xiao is the primary advisor
- **Bold Italic Font:** Ph.D. Student, researcher, or intern for whom Dr. Xiao is a co-advisor or has significant mentoring responsibility

- Underline Font: Master's Student for whom Dr. Xiao is the primary advisor or a co-advisor
- (#) Undergraduate Student
- (+) Equal Contributions (if not equal include % of participation)

Under Submission:

- ICSE'26 [I5] **Shang Ma**, Yanfang (Fanny) Ye*, and Xusheng Xiao*. AdSadel: Unifying Static Ad Analysis and Dynamic UI Exploration with LLM for Mobile Ad Detection. *Under Submission to the International Conference on Software Engineering (ICSE)*, 2026.
- ICSE'26 [I4] **Zichen Liu**, Yanfang (Fanny) Ye, and Xusheng Xiao*. AppBDS: LLM-Powered Description Synthesis for Sensitive Behaviors in Mobile Apps. *Under Submission to the International Conference on Software Engineering (ICSE)*, 2026.
- CCS'25 [I3] **Liangyi Huang**, **Katherine Liu**, Yanfang (Fanny) Ye, and Xusheng Xiao*. Revealing Hidden Behaviors and Relationships from Cyber Threats Intelligence via LLM-Powered Knowledge Graph Construction. *Under Submission to the ACM Conference on Computer and Communications Security (CCS)*, 2025.
- CCS'25 [I2] **Fei Shao**, Jia Zou, Zhichao Cao, and Xusheng Xiao*. ProGQL: A Provenance Graph Query System for Efficient Cyber Threat Investigation. *Under Submission to the ACM Conference on Computer and Communications Security (CCS)*, 2025.
- ASE'25 [I1] **Weiyu Chen**, Kailong Wang, and Xusheng Xiao*. FUZZANYTHING: Automated Fuzz Driver Generation with Large Language Models. *Under Submission to the IEEE/ACM Automated Software Engineering Conference (ASE)*, 2025.

Refereed Conference Papers

- NDSS'25 [C52] **Shang Ma**, **Chaoran Chen**, **Shao Yang**, Shifu Hou, Toby Jia-Jun Li, Xusheng Xiao*, Tao Xie, and Yanfang (Fanny) Ye*. Careful About What App Promotion Ads Recommend! Detect and Explain Malware Promotion via App Promotion Graph. *In Proceedings of the Network and Distributed System Security Symposium (NDSS)*, 2025.
- SIGMOD'25 [C51] **Hong Guan**, Lixi Zhou, Lei Yu, Li Xiong, Kanchan Chowdhury, Lulu Xie, Xusheng Xiao, and Jia Zou*. Privacy and Accuracy-Aware AI/ML Model Deduplication. *In Proceedings of the ACM SIGMOD/PODS International Conference on Management of Data (SIGMOD)*, 2025.
- ICSE'24 [C50] **Haodong Li**, **Guosheng Xu**, **Liu Wang**, Xusheng Xiao, Guoai Xu, and Haoyu Wang. MalCertain: Enhancing Deep Neural Network Based Android Malware Detection by Tackling Prediction Uncertainty *In Proceedings of the International Conference on Software Engineering (ICSE)*, 2024.
- NDSS'24 [C49] **Shaofei Li**, **Feng Dong**, Ding Li, Xusheng Xiao, Haoyu Wang, **Fei Shao**, Jiedong Chen, Yao Guo, and Xiangqun Chen. NODLINK: An Online System for Fine-Grained APT Attack Detection and Investigation. *In Proceedings of the Network and Distributed System Security Symposium (NDSS)*, 2024.
- COLM'24 [C48] **Liangyi Huang** and Xusheng Xiao*. CTIKG: LLM-Powered Knowledge Graph Construction from Cyber Threat Intelligence. *In Proceedings of the First Conference on Language Modeling (COLM)*, 2024.
- ECML PKDD'24 [C47] Zhongyu Ouyang, Chunhui Zhang, Shifu Hou, Shang Ma, Chaoran Chen, Toby Li, Xusheng Xiao, Chuxu Zhang, and Yanfang Ye. Completing the App Promotion Graph with Symbolic Prompting. *In Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, 2024.

- ICSME'24 [C46] **Pengcheng Fang**, Peng Gao, Yun Peng, Qingzhao Zhang, Tao Xie, Dawn Song, Prateek Mittal, Sanjeev Kulkarni, Zhuotao Liu, and Xusheng Xiao*. vFix: Facilitating Software Maintenance of Smart Contracts via Automatically Fixing Vulnerabilities. *In Proceedings of the IEEE International Conference on Software Maintenance and Evolution (ICSME)*, 2024.
- CCS'23 [C45] **Feng Dong**, Shaofei Li, Peng Jiang, Ding Li, Haoyu Wang, **Liangyi Huang**, Xusheng Xiao*, Jiedong Chen, Xiapu Luo, Yao Guo, and Xiangqun Chen. Are we there yet? An Industrial Viewpoint on Provenance-based Endpoint Detection and Response Tools. *In Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, 2023.
- ASE'23 [C44] **Shi Meng**, **Liu Wang**, Shenao Wang, Kailong Wang, Xusheng Xiao, Guangdong Bai, and Haoyu Wang. WeMinT: Tainting Sensitive Data Leaks in WeChat Mini-Programs. *In Proceedings of the IEEE/ACM Automated Software Engineering Conference (ASE)*, 2023.
- Security'23 [C43] **Feng Dong**, Liu Wang, Xu Nie, **Fei Shao**, Haoyu Wang, Ding Li, Xiapu Luo, and Xusheng Xiao*. DISTDET: A Cost-Effective Distributed Cyber Threat Detection System. *In Proceedings of the USENIX Security Symposium (USENIX Security)*, 2023.
- Security'23 [C42] Zhaohan Xi, Tianyu Du, Changjiang Li, Ren Pang, Shouling Ji, Xiapu Luo, Xusheng Xiao, Fenglong Ma, and Ting Wang. On the Security Risks of Knowledge Graph Reasoning. *In Proceedings of the USENIX Security Symposium (USENIX Security)*, 2023.
- ISSTA'23 [C41] **Pengcheng Fang**, Zhenhua Zou, Xusheng Xiao*, and Zhuotao Liu. iSyn: Semi-Automated Smart Contract Synthesis from Legal Financial Agreements. *In Proceedings of the ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, 2023.
- ICSE'22 [C40] **Changlin Liu**, Hanlin Wang, Tianming Liu, Diandian Gu, Yun Ma, Haoyu Wang, and Xusheng Xiao*. Promal: Precise Window Transition Graphs for Android via Synergy of Program Analysis and Machine Learning. *In Proceedings of the International Conference on Software Engineering (ICSE)*, 2022.
- ICSE'22 [C39] **Shao Yang**, **Yuehan Wang**[#], Yuan Yao, Haoyu Wang, Yanfang (Fanny) Ye, and Xusheng Xiao*. DescribeCtx: Context-Aware Description Synthesis for Sensitive Behaviors in Mobile Apps. *In Proceedings of the International Conference on Software Engineering (ICSE)*, 2022.
- IEEE S&P'22 [C38] **Zhiqiang Xu**, **Pengcheng Fang**, **Changlin Liu**, Xusheng Xiao*, Yu Wen*, and Dan Meng. Graph Summarization on System Audit Logs for Attack Investigation. *In Proceedings of the IEEE Symposium on Security and Privacy (IEEE S&P)*, 2022.
- Security'22 [C37] **Pengcheng Fang**⁺, Peng Gao⁺, **Changlin Liu**, Erman Ayday, Kangkook Jee, Ting Wang, Yanfang Ye, Zhuotao Liu, and Xusheng Xiao*. Back-Propagating System Dependency Impact for Attack Investigation. *In Proceedings of the USENIX Security Symposium (USENIX Security)*, 2022.
- SIGMETRICS [C36] Pengcheng Xia, Haoyu Wang, Weihang Su, Zhou Yu, Xiapu Luo, Chao Zhang, Xusheng Xiao, and Guoai Xu. Trade or Trick? Detecting and Characterizing Scam Tokens on Uniswap Decentralized Exchange. *In Proceedings of the ACM SIGMETRICS / IFIP Performance (SIGMETRICS)*, 2022.
- WWW'22 [C35] Guosheng Xu, Siyi Li, Hao Zhou, Shucen Liu, Yutian Tang, Li Li, Xiapu Luo, Xusheng Xiao, Guoai Xu, and Haoyu Wang. Lie to Me: Abusing the Mobile Content Sharing Service for Fun and Profit. *In Proceedings of the ACM Web Conference (WWW)*, 2022.
- ISSTA'21 [C34] **Fei Shao**, **Rui Xu**, Wasif Haque, Jingwei Xu, Ying Zhang, Wei Yang, Yanfang Ye, and Xusheng Xiao*. WebEvo: Taming Web Application Evolution via Detecting Semantic Structure Change. *In Proceedings of the ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, 2021.

- ICSE'21 [C33] **Yangyu Hu**, Haoyu Wang*, Tiantong Ji, Xusheng Xiao*, Xiapu Luo, Peng Gao, and Yao Guo. CHAMP: Characterizing Undesired App Behaviors from User Comments based on Market Policies. *In Proceedings of the International Conference on Software Engineering (ICSE)*, 2021.
- ICDE'21 [C32] Peng Gao, **Fei Shao**, Xiaoyuan Liu, Xusheng Xiao*, Zheng Qin, Fengyuan Xu, Prateek Mittal, Sanjeev Kulkarni, and Dawn Song*. Enabling Efficient Cyber Threat Hunting With Cyber Threat Intelligence. *In Proceedings of the IEEE International Conference on Data Engineering (ICDE)*, 2021.
- ICDE'20 [C31] **Jiaping Gui**, Ding Li*, Zhengzhang Chen, Junghwan Rhee, Xusheng Xiao*, Mu Zhang, Kangkook Jee, Zhichun Li, and Haifeng Chen. APTrace: A Responsive System for Agile Enterprise Level Causality Analysis. *In Proceedings of the IEEE International Conference on Data Engineering (ICDE), Industry and Application Track*, 2020.
- **Granted US Patent 10831750**
- ICDM'20 [C30] Yujie Fan, Yanfang Ye, Qian Peng, Jianfei Zhang, Yiming Zhang, Xusheng Xiao, Chuan Shi, Qi Xiong, Fudong Shao, and Liang Zhao. Metagraph Aggregated Heterogeneous Graph Neural Network for Illicit Traded Product Identification in Underground Market. *In Proceedings of the IEEE International Conference on Data Mining (ICDM)*, 2020.
- ICKG'20 [C29] Yiming Zhang, Yujie Fan, Shifu Hou, Yanfang Ye, Xusheng Xiao, Pan Li, Chuan Shi, Liang Zhao, and Shouhuai Xu. Cyber-guided Deep Neural Network for Malicious Repository Detection in GitHub. *In Proceedings of the IEEE International Conference on Knowledge Graph (ICKG)*, 2020.
- CCS'19 [C28] **Shengqu Xi**⁺, **Shao Yang**⁺, Xusheng Xiao*, Yuan Yao*, Yayuan Xiong, Fengyuan Xu, Haoyu Wang, Peng Gao, Zhuotao Liu, Feng Xu, and Jian Lu. DeepIntent : Deep Icon-Behavior Learning for Detecting Intention-Behavior Discrepancy in Mobile Apps. *In Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, 2019.
- CCS'19 [C27] Zhuotao Liu*, **Yangxi Xiang**, **Jian Shi**, **Peng Gao**, Haoyu Wang, Xusheng Xiao*, Bihan Wen, and Yih-Chun Hu. HyperService: Interoperability and Programmability across Heterogeneous Blockchains. *In Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, 2019.
- ICSE'19 [C26] Xusheng Xiao*, Xiaoyin Wang, **Zhihao Cao**, **Hanlin Wang**, **Peng Gao**. IconIntent: Automatic Identification of Sensitive UI Widgets based on Icon Classification for Android Apps. *In Proceedings of the International Conference on Software Engineering (ICSE)*, 2019.
- ASE'19 [C25] Zhilei Ren, **Changlin Liu**, Xusheng Xiao, He Jiang and Tao Xie. Root Cause Localization for Unreproducible Builds via Causality Analysis over System Call Tracing. *In Proceedings of the IEEE/ACM International Conference on Automated Software Engineering (ASE)*, 2019.
- ASE'19 [C24] Haoyu Wang, Hongxuan Liu, Xusheng Xiao, Guozhu Meng and Yao Guo. Characterizing Android App Signing Issues. *In Proceedings of the IEEE/ACM International Conference on Automated Software Engineering (ASE)*, 2019.
- ACSAC'19 [C23] **Jiaping Gui**, Xusheng Xiao*, Ding Li, Chung Hwan Kim, and Haifeng Chen. Progressive Processing of System Behavioral Query . *In Proceedings of the Annual Computer Security Applications Conference (ACSAC)*, 2019.
- **Granted US Patent 10885027**
- RTAS'19 [C22] **Xia Zhang**, Xusheng Xiao*, Liang He, Yun Ma, Yangyang Huang, Xuanzhe Liu, Wen Yao Xu, Cong Liu. PIFA: An Intelligent Phase Identification and Frequency Adjustment Framework for Time-Sensitive Mobile Computing. *In Proceedings of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)*, 2019.

- Security'18 [C21] **Peng Gao**, Xusheng Xiao*, Ding Li, Zhichun Li, Kangkook Jee, Zhenyu Wu, Chung Hwan Kim, Sanjeev R. Kulkarni, Prateek Mittal. SAQL: A Stream-based Query System for Real-Time Abnormal System Behavior Detection. *In Proceedings of the USENIX Security Symposium (USENIX Security)*, 2018.
 - **Top ten finalists for CSAW Best Applied Research Paper Award**
 - **Granted US Patent 10909242**
- ATC'18 [C20] **Peng Gao**, Xusheng Xiao*, Zhichun Li, Kangkook Jee, Fengyuan Xu, Sanjeev R. Kulkarni, Prateek Mittal. AIQL: Enabling Efficient Attack Investigation from System Monitoring Data. *In Proceedings of the USENIX Annual Technical Conference (USENIX ATC)*, 2018.
 - **Integrated in the NEC Corporation's Automated Security Intelligence solution, which won the 1st place in the 2016 CEATEC Town Life and Society Innovation Award and was commercialized.**
 - **Granted US Patent 10860582**
- CCS'18 [C19] **Yutao Tang**, Ding Li, Zhichun Li*, Mu Zhang, Kangkook Jee, Xusheng Xiao*, Zhenyu Wu, Junghwan Rhee, Fengyuan Xu, and Qun Li. NodeMerge: Template Based Efficient Data Reduction For Big-Data Causality Analysis. *In Proceedings of the 23rd ACM Conference on Computer and Communications Security (CCS)*, 2018.
- DSN'18 [C18] **Angello Astorga**, Siwakorn Srisakaokul, Xusheng Xiao*, and Tao Xie*. PreInfer: Automatic Inference of Preconditions via Symbolic Analysis. *In Proceedings of the 48th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2018.
- ICSE'18 JF [C17] Patrick Morrison, Rahul Pandita, Xusheng Xiao*, Ram Chillarege, and Laurie Williams*. Are Vulnerabilities Discovered and Resolved Like Other Defects? *In Proceedings of the International Conference on Software Engineering (ICSE), Journal First Paper*, 2018.
- SEC'17 [C16] Zheng Dong, Yuchuan Liu, Husheng Zhou, Xusheng Xiao, Yu Gu, Lingming Zhang and Cong Liu. An Energy-efficient Offloading Framework with Predictable Temporal Correctness. *In Proceedings of ACM/IEEE Symposium on Edge Computing (SEC)*, 2017.
- HotSoS'17 [C15] Dengfeng Li, Wing Lam, Wei Yang, Zhengkai Wu, Xusheng Xiao, and Tao Xie. Towards Privacy-Preserving Mobile Apps: A Balancing Act. *In Proceedings of the Symposium and Bootcamp on the Science of Security (HotSoS)*, 2017.
- VLDB'16 [C14] **Bo Zong**, Xusheng Xiao*, Zhichun Li, Zhenyu Wu, Zhiyun Qian, Xifeng Yan, Ambuj Singh, and Guofei Jiang. Behavior Query Discovery in Temporal Graphs. *In Proceedings of the 42nd International Conference on Very Large Data Bases (VLDB)*, 2016.
- CCS'16 [C13] **Zhang Xu**, Zhenyu Wu, Zhichun Li*, Kangkook Jee, Junghwan Rhee, Xusheng Xiao*, Fengyuan Xu, Haining Wang, and Guofei Jiang. High Fidelity Data Reduction for Big Data Security Dependency Analyses. *In Proceedings of the 23rd ACM Conference on Computer and Communications Security (CCS)*, 2016.
- ICSE Edu'16 [C12] Sihan Li, Xusheng Xiao*, Blake Bassett, Tao Xie*, and Nikolai Tillmann. Measuring Code Behavioral Similarity for Programming and Software Engineering Education. *In Proceedings of the 2016 International Conference on Software Engineering (ICSE), Education Track*, 2016.
- Security'15 [C11] **Jianjun Huang**, Zhichun Li*, Xusheng Xiao*, Zhenyu Wu, Kangjie Lu, Xiangyu Zhang, and Guofei Jiang. SUPOR: Precise and Scalable Sensitive User Input Detection for Android Apps. *In Proceedings of the 24th USENIX Security Symposium (USENIX Security)*, pages 977–992, 2015.
 - **Top ten finalists for CSAW Best Applied Research Paper Award**
 - **Granted US Patent 9870485**

- ICSE'15 [C10] **Wei Yang**, Xusheng Xiao*, Sihan Li, Benjamin Andow, William Enck, and Tao Xie*. AppContext: Differentiating Malicious and Benign Mobile App Behaviors Using Context. *In Proceedings of the 37th International Conference on Software Engineering (ICSE)*, pages 303–312, 2015.
- ISSTA'14 [C9] Xusheng Xiao, Gogul Balakrishnan, Franjo Ivancic, Naoto Maeda, Aarti Gupta, and Deepak Chhetri. ARC++: Effective Typestate and Lifetime Dependency Analysis. *In Proceedings of the 2014 International Symposium on Software Testing and Analysis (ISSTA)*, pages 116–126, 2014.
- ACSAC'14 [C8] John Slankas, Xusheng Xiao, Laurie Williams, and Tao Xie. Relation Extraction for Inferring Access Control Rules from Natural Language Artifacts. *In Proceedings of the 2014 Annual Computer Security Applications Conference (ACSAC)*, pages 366–375, 2014.
- ISSTA'13 [C7] Xusheng Xiao, Shi Han, Tao Xie, and Dongmei Zhang. Context-Sensitive Delta Inference for Identifying Workload-Dependent Performance Bottlenecks. *In Proceedings of the 2013 International Symposium on Software Testing and Analysis (ISSTA)*, pages 90–100, 2013.
- ASE'13 [C6] Xusheng Xiao, Sihan Li, Tao Xie, and Nikolai Tillmann. Characteristic Studies of Loop Problems for Structural Test Generation via Symbolic Execution. *In Proceedings of the 28th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, pages 246–256, 2013.
- Security'13 [C5] Rahul Pandita, Xusheng Xiao, Wei Yang, William Enck, and Tao Xie. WHYPER: Towards Automating Risk Assessment of Mobile Applications. *In Proceedings of the 22nd USENIX Security Symposium (USENIX Security)*, pages 527–542, 2013.
- FSE'12 [C4] Xusheng Xiao, Amit Paradkar, Suresh Thummalapenta, and Tao Xie. Automated Extraction of Security Policies from Natural-Language Software Documents. *In Proceedings of the 20th ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE)*, pages 12:1–12:11, 2012.
- ASE'12 [C3] Xusheng Xiao, Nikolai Tillmann, Manuel Fahndrich, Jonathan de Halleux, and Michal Moskal. User-Aware Privacy Control via Static-Information-Flow Analysis. *In Proceedings of the 24th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, pages 80–89, 2012.
- Deployed in TouchDevelop (www.touchdevelop.com), Microsoft Research
- Granted US Patent 9104528
- Invited for journal submission
- ICSE'12 [C2] Rahul Pandita, Xusheng Xiao, Hao Zhong, Tao Xie, Stephen Oneyz and Amit Paradkar. Inferring Method Specifications from Natural Language API Descriptions. *In Proceedings of the 34th International Conference on Software Engineering (ICSE)*, pages 815–825, 2012.
- ICSE'11 [C1] Xusheng Xiao, Tao Xie, Nikolai Tillmann, and Jonathan de Halleux. Precise Identification of Problems for Structural Test Generation. *In Proceedings of the 33rd International Conference on Software Engineering (ICSE)*, pages 611–620, 2011.

Refereed Journal Articles & Book Chapters

- TSE'23 [J12] Le Yu, Haoyu Wang, Xiapu Luo, Tao Zhang, Kang Liu, Jiachi Chen, Hao Zhou, Yutian Tang, and Xusheng Xiao. Towards Automatically Localizing Function Errors in Mobile Apps with User Reviews. *IEEE Transactions on Software Engineering (TSE)*, 49(4): 1464-1486, 2023.
- SciChina'23 [J11] **Yi Liu**, Yun Ma, Xusheng Xiao*, Tao Xie, and Xuanzhe Liu. LegoDroid : Flexible Android Apps Decomposition and Instant Installation. *Science China Information Sciences*, 66 (4), 1–19, 2023.

- TDSC'22 [J10] Zhuotao Liu, **Yangxi Xiang**, Jian Shi, Peng Gao, Haoyu Wang, Xusheng Xiao*, Bihan Wen, Qi Li, and Yih-Chun Hu. Making Web 3.0 Connected. *IEEE Transactions on Dependable and Secure Computing (TDSC)*, 19(5): 2965-2981, 2022.
- Environment'21 [J9] Shifa Zhong, Kai Zhang, Majid Bagheri, Joel G. Burken, April Gu, Baikun Li, Xingmao Ma, Babetta L. Marrone, Zhiyong Jason Ren, Joshua Schrier, Wei Shi, Haoyue Tan, Tianbao Wang, Xu Wang, Bryan M. Wong, Xusheng Xiao, Xiong Yu, Jun-Jie Zhu, and Huichun Zhang. Machine learning: New ideas and tools in Environmental Science and Engineering. *Environment Science & Technology*, 55(19): 12741-12754, 2021.
- **2021 ES&T Best Paper Award**
- JCST'19 [J8] **Shengqu Xi**, Yuan Yao, Xusheng Xiao, Feng Xu, and Jian Lu. Bug Triaging Based on Tossing Sequence Modeling. *Journal of Computer Science and Technology (JCST)*, 2019.
- EMSE'17 [J7] Patrick Morrison, Rahul Pandita, Xusheng Xiao*, Ram Chillarege, and Laurie Williams. Are Vulnerabilities Discovered and Resolved Like Other Defects? *Empirical Software Engineering Journal (EMSE)*, 23(3): 1383-1421, 2017.
- **Accepted to the 2018 International Conference on Software Engineering (ICSE) as a Journal-First Paper.**
- JCST'16 [J6] Xusheng Xiao*, Jian-Guang Lou, Shan Lu, David C. Shepherd, Xin Peng, and Qianxiang Wang. Roundtable: Research Opportunities and Challenges for Large-Scale Software Systems. *Journal of Computer Science and Technology (JCST)*, 31(5): 851-860, 2016.
- Sci China'16 [J5] Qing Gao, Xusheng Xiao*, Jun Li, Yingfei Xiong, Kunal Taneja, Dan Hao, Lu Zhang, and Tao Xie. High-Confidence Software Evolution. *Science China Information Sciences*, 59(7): 071101:1-071101:19, 2016.
- JCS'16 [J4] Wei Yang, Xusheng Xiao, Dengfeng Li, Huoran Li, Xuanzhe Liu, Haoyu Wang, Yao Guo, and Tao Xie. Security Analytics for Mobile Apps: Achievements and Challenges. *Journal of Cyber Security (in Chinese)*, 1(2): 1-14, 2016.
- ASEJ'15 [J3] Xusheng Xiao*, Nikolai Tillmann, Manuel Fahndrich, Jonathan de Halleux, Michal Moskal, and Tao Xie. User-Aware Privacy Control via Extended Static-Information-Flow Analysis. *Automated Software Engineering Journal (ASEJ)*, 22(3): 333-366, 2015.
- JCST'14 [J2] Tao Xie, Lu Zhang, Xusheng Xiao, Yingfei Xiong, and Dan Hao. Cooperative Software Testing and Analysis: Advances and Challenges. *Journal of Computer Science and Technology (JCST)*, 29(4): 713-723, 2014.
- Adv. Com.'12 [J1] Xusheng Xiao, Suresh Thummalapenta, and Tao Xie. Advances on Improving Automation in Developer Testing. In *Advances in Computers*, Burlington: Academic Press, 85: 165-212, 2012.

Refereed Workshop, Demonstration, Tutorial Papers

- CIKM Demo'22 [W12] **Liangyi Huang**, Sophia Hall, **Fei Shao**, Arafath Nihar, Vipin Chaudhary, Yinghui Wu, Roger French, and Xusheng Xiao*. System-Auditing, Data Analysis and Characteristics of Cyber Attacks for Big Data Systems. In *Proceedings of the Conference on Information and Knowledge Management (CIKM)*, Demonstrations Track, 2022.
- ICDE Demo'21 [W11] Peng Gao, **Fei Shao**, Xiaoyuan Liu, Xusheng Xiao, Haoyuan Liu, Zheng Qin, Fengyuan Xu, Prateek Mittal, Sanjeev Kulkarni, and Dawn Song. A System for Efficiently Hunting for Cyber Threats in Computer Systems Using Threat Intelligence. In *Proceedings of the IEEE International Conference on Data Engineering (ICDE)*, Demonstrations Track, 2021.
- ICSE Demo'20 [W10] **Jian Liu**, Xusheng Xiao*, Lihua Xu, Liang Dou, and Andy Podgurski. DroidMutator: An Effective Mutation Analysis Tool for Android Applications. In *Proceedings of the 33rd International Conference on Software Engineering (ICSE)*, Demonstrations Track, 2020.

- ICDE Demo'20 [W9] **Peng Gao**, Xusheng Xiao*, Ding Li, Kangkook Jee, Haifeng Chen, Sanjeev R. Kulkarni, and Prateek Mittal. Querying Streaming System Monitoring Data for Enterprise System Anomaly Detection. *In Proceedings of the IEEE International Conference on Data Engineering (ICDE)*, Demonstrations Track2020.
- VLDB Demo'19 [W8] **Peng Gao**, Xusheng Xiao*, Zhichun Li, Kangkook Jee, Fengyuan Xu, Sanjeev R. Kulkarni, Prateek Mittal. A Query System for Efficiently Investigating Complex Attack Behaviors for Enterprise Security. *In Proceedings of the International Conference on Very Large Data Bases (VLDB)*, 2019.
- HotMobile'19 [W7] Yun Ma, Yangyang Huang, Ziniu Hu, Xusheng Xiao*, Xuanzhe Liu. Paladin: Automated Generation of Reproducible Test Cases for Android Apps. *In Proceedings of the Workshop on Mobile Computing Systems and Applications (HotMobile)*, 2019.
- FSE Demo'17 [W6] Yujie Yuan, Lihua Xu, Xusheng Xiao*, Andy Podguiski, Huibiao Zhu. RunDroid: Recovering Execution Call Graph for Android Applications. *In Proceedings of the 11th joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE), Demonstrations Track*, 2017.
- HotSoS'17 [W5] Xusheng Xiao*. Tutorial: System Monitoring for Security. *The 4th Annual Hot Topics in the Science of Security Symposium and Bootcamp (HotSoS)*, 2017.
- HotSoS'17 [W4] Dengfeng Li, Wing Lam, Wei Yang, Zhengkai Wu, Xusheng Xiao, Tao Xie. Towards Privacy-Preserving Mobile Apps: A Balancing Act. *The 4th Annual Hot Topics in the Science of Security Symposium and Bootcamp (HotSoS)*, 2017.
- HotSoS'14 [W3] Wei Yang, Xusheng Xiao, Rahul Pandita, William Enck, and Tao Xie. Improving Mobile Application Security via Bridging User Expectations and Application Behaviors. *The 1st Annual Hot Topics in the Science of Security Symposium and Bootcamp (HotSoS)*, 2014.
- ICSE SRC'11 [W2] Xusheng Xiao. Problem Identification for Structural Test Generation: First Step Towards Cooperative Developer Testing. *ACM Student Research Competition (SRC) at ICSE 2011*.
- **Best Project Representing an Innovative Use of Microsoft Technology in ACM SRC Grand Final 2012**
- ICSE Demo'11 [W1] Xusheng Xiao, Tao Xie, Nikolai Tillmann, and Jonathan de Halleux. Covana: Precise Identification of Problems in Pex. *In Proceedings of the 33rd International Conference on Software Engineering (ICSE), Demonstrations Track*, pages 1004-1006, 2011.

Patents

Patents can be found at <https://patents.google.com/?inventor=Xusheng+Xiao>

- Granted [P10] Ding Li, Xusheng Xiao, Zhichun L, Guofei Jiang, and Peng Gao. System and method for detecting security risks in a computer system. 2021. US Patent 10909242.
- Granted [P9] Xusheng Xiao, Zhichun L, Mu Zhang, Guofei Jiang, and Jiaping Gui. Progressive processing for querying system behavior. 2021. US Patent 10885027.
- Granted [P8] Xusheng Xiao, Zhichun Li, Fengyuan Xu, Peng Gao, and Guofei Jiang. Risky Behavior Query Construction and Execution. 2020. US Patent 10860582.
- Granted [P7] Xusheng Xiao, Zhichun Li, Mu Zhang, Guofei Jiang, Jiaping Gui, and Ding Li. Security Monitoring with Progressive Behavioral Query Language Database. 2020. US Patent 10831750.
- Granted [P6] Zhichun Li, Xusheng Xiao, Zhenyu Wu, Jianjun Huang, Guofei Jiang. System and Method for Detecting Sensitive User Input Leakages in Software Applications. 2018. US Patent 9870485.
- Granted [P5] Xusheng Xiao, Nikolai Tillmann, Manuel Fahndrich, Jonathan de Halleux, and Michal Moskal. Controlling the Release of Private Information Using Static Flow Analysis. 2015. US Patent 9104528.

Submitted	[P4]	Zhichun Li, Xusheng Xiao, Zhenyu Wu, Bo Zong, and Guofei Jiang. Method and System for Behavior Query Construction in Temporal Graphs using Discriminative Sub-trace Mining. US 20160125094 A1.
Submitted	[P3]	Aarti Gupta, Gogul Balakrishnan, Franjo Ivancic, and Xusheng Xiao. Effective Lifetime Dependency Analysis and Typestate Analysis. US 20140289712 A1.
Submitted	[P2]	Zhenyu Wu, Zhang Xu, Zhichun Li, Xusheng Xiao, Kangkook Jee, Junghwan Rhee, Guofei Jiang, and Fengyuan Xu. High Fidelity Data Reduction for System Dependency Analysis.
Submitted	[P1]	Xusheng Xiao, Zhichun Li, Zhenyu Wu, Fengyuan Xu, and Guofei Jiang. Scalable Data Stream Management System for Monitoring System Activities.

Invited Talks

SUMMARY OF PRESENTATIONS

- Invited Presentations – External: 31
- Invited Presentations – Internal: 2
- Refereed Conference Presentations, including students: 57

Invited Presentations – External

- 2024 Cyber Threat Investigation via Causality Modeling in Audit Logging, **Distinguished Seminar**, Department of Electrical Engineering and Computer Science, University of Arkansas.
- 2023 Enhancing Mobile App Security via Contextual Integrity and User Awareness, **Distinguished Seminar**, Department of Computer Science, Indiana University Bloomington, Virtual.
- 2022 Enhancing Mobile App Security via Contextual Integrity and User Awareness, Department of Electrical Engineering and Computer Science, Syracuse University, Virtual.
- 2021 HyperService: Interoperability and Programmability across Heterogeneous Blockchains, International Conference on Blockchain and Trustworthy Systems (BlockSys), Virtual.
- 2019 HyperService: Interoperability and Programmability across Heterogeneous Blockchains, Blockland Solutions, USA.
- 2019 HyperService: Interoperability and Programmability across Heterogeneous Blockchains, IEEE Cleveland Section, USA.
- 2018 Enabling Effective and Efficient APT Defenses via Querying System Monitoring Data, Palo Alto Networks, USA.
- 2018 Enabling Effective and Efficient APT Defenses via Querying System Monitoring Data, RSA Labs, USA.
- 2016–2017 Improving Mobile App Security via Analyzing Structured and Unstructured Artifacts.
 - Case Western Reserve University, USA, Nov. 2016.
 - Iowa State University, USA, Jan. 2017.
- 2016 Automatic Security Analysis of Smartphone Applications: Challenges And Opportunities
 - College of William & Mary, Feb. 2016
 - University of California, Riverside, Feb. 2016
 - University of Nebraska, Lincoln, Mar. 2016
 - University of California, Santa Cruz, Mar. 2016
 - Imperial College London, Mar. 2016

- Oregon State University, Mar. 2016
- George Mason University, Apr. 2016
- Washington State University, Apr. 2016
- 2014 Cooperative Testing and Analysis via Informed Decision Making.
 - Fujitsu Laboratories of America, Inc., Sunnyvale, USA, Nov. 2013.
 - Oakland University, USA, Feb. 2014.
 - Louisiana State University, USA, Feb. 2014.
 - Georgia Institute of Technology, USA, Feb. 2014.
 - NEC Labs America, USA, Mar. 2014.
 - Microsoft Research Redmond, USA, Mar. 2014.
- 2014 WHYPER: Towards Automating Risk Assessment of Mobile Applications, Google Research, Mountain View, USA.
- 2013 Cooperative Testing and Analysis via Informed Decision Making. Midwest Verification Day (MVD), University of Illinois at Chicago, USA.
- 2013 WHYPER: Towards Automating Risk Assessment of Mobile Applications. Microsoft Research Redmond, USA.
- 2011 Construction and Validation of Access Control Policies via Natural Language Processing and Policy Verification. Association of Graduates, United States Air Force Academy, Colorado, USA.
- 2011 Precise Identification of Problems for Structural Test Generation. Microsoft Research Redmond, USA.
- 2011 Automatic Construction and Validation of Access Control Policies from Natural-Language Documents. National Institute of Standards and Technology (NIST), USA.

Invited Presentations – Internal

- 2020 HyperService: Interoperability and Programmability across Heterogeneous Blockchains, Departmental Seminar, Department of Computer and Data Sciences, Case Western Reserve University, USA.
- 2019 Improving Mobile App Security via Synergy of Program Analysis and Machine Learning, Department of Civil Engineering, Case Western Reserve University, USA.

Refereed Conference Presentations

- NDSS'25 Careful About What App Promotion Ads Recommend! Detecting and Explaining Malware Promotion via App Promotion Graph
- NDSS'24 NODLINK: An Online System for Fine-Grained APT Attack Detection and Investigation
- ICSE'24 MalCertain: Enhancing Deep Neural Network Based Android Malware Detection by Tackling Prediction Uncertainty
- COLM'24 CTIKG: LLM-Powered Knowledge Graph Construction from Cyber Threat Intelligence
- ECML PKDD'24 Completing the App Promotion Graph with Symbolic Prompting
- ICSM'24 vFix: Facilitating Software Maintenance of Smart Contracts via Automatically Fixing Vulnerabilities
- CCS'24 Are we there yet? An Industrial Viewpoint on Provenance-based Endpoint Detection and Response Tools
- ISSTA'23 iSyn: Semi-Automated Smart Contract Synthesis from Legal Financial Agreements
- Security'23 DISTDET: A Cost-Effective Distributed Cyber Threat Detection System
- Security'23 On the Security Risks of Knowledge Graph Reasoning

- ASE'23 WeMinT: Tainting Sensitive Data Leaks in WeChat Mini-Programs
- GLFrontier'23 Prompt Learning Unlocked for App Promotion in the Wild
- IEEE S&P'22 DepComm: Graph Summarization on System Audit Logs for Attack Investigation
- Security'22 Back-Propagating System Dependency Impact for Attack Investigation
- ICSE'22 DescribeCtx: Context-Aware Description Synthesis for Sensitive Behaviors in Mobile Apps
- ICSE'22 Promal: Precise Window Transition Graphs for Android via Synergy of Program Analysis and Machine Learning
- SIGMETRICS'22 Trade or Trick? Detecting and Characterizing Scam Tokens on Uniswap Decentralized Exchange
- WWW'22 Lie to Me: Abusing the Mobile Content Sharing Service for Fun and Profit
- FSE'22 What Did You Pack in My App? A Systematic Analysis of Commercial Android Packers
- CKIM'22 System-Auditing, Data Analysis and Characteristics of Cyber Attacks for Big Data Systems
- PVSC'22 FAIRification, Quality Assessment, and Missingness Pattern Discovery for Spatiotemporal Photovoltaic Data
- ISSTA'21 WebEvo: Taming Web Application Evolution via Detecting Semantic Structure Change
- ICDE'21 Enabling Efficient Cyber Threat Hunting With Cyber Threat Intelligence
- ICSE'21 CHAMP: Characterizing Undesired App Behaviors from User Comments based on Market Policies
- ICDE'21 A System for Efficiently Hunting for Cyber Threats in Computer Systems Using Threat Intelligence
- ICDE'20 APTrace: A Responsive System for Agile Enterprise Level Causality Analysis.
- ICDM'20 Metagraph Aggregated Heterogeneous Graph Neural Network for Illicit Traded Product Identification in Underground Market.
- ICKG'20 Cyber-guided Deep Neural Network for Malicious Repository Detection in GitHub
- ICDE'20 Querying Streaming System Monitoring Data for Enterprise System Anomaly Detection
- ICSE'20 DroidMutator: An Effective Mutation Analysis Tool for Android Applications
- CCS'19 HyperService: Interoperability and Programmability across Heterogeneous Blockchains.
- CCS'19 DeepIntent : Deep Icon-Behavior Learning for Detecting Intention-Behavior Discrepancy in Mobile Apps.
- ICSE'19 IconIntent: Automatic Identification of Sensitive UI Widgets based on Icon Classification for Android Apps.
- ASE'19 Root Cause Localization for Unreproducible Builds via Causality Analysis over System Call Tracing.
- ASE'19 Characterizing Android App Signing Issues.
- ACSAC'19 Progressive Processing of System Behavioral Query.
- HostMobile'19 Paladin: Automated Generation of Reproducible Test Cases for Android Apps.
- VLDB'19 A Query System for Efficiently Investigating Complex Attack Behaviors for Enterprise Security.
- ATC'18 AIQL: Enabling Efficient Attack Investigation from System Monitoring Data.
- Security'18 SAQL: A Stream-based Query System for Real-Time Abnormal System Behavior Detection.

- CCS'18 NodeMerge: Template Based Efficient Data Reduction For Big-Data Causality Analysis.
- ICSE'18 Are Vulnerabilities Discovered and Resolved Like Other Defects?.
- DSN'18 PreInfer: Automatic Inference of Preconditions via Symbolic Analysis.
- HotSoS'17 Tutorial: System Monitoring for Security.
- CCS'16 High Fidelity Data Reduction for Big Data Security Dependency Analyses.
- VLDB'16 Behavior Query Discovery in System-Generated Temporal Graphs.
- ICSE'15 AppContext: Differentiating Malicious and Benign Mobile App Behaviors Under Context.
- Security'15 SUPOR: Precise and Scalable Sensitive User Input Detection for Android Apps.
- ISSTA'14 ARC++: Effective Typestate and Lifetime Dependency Analysis.
- PERTEA'14 Context-Sensitive Delta Inference for Identifying Workload-Dependent Performance Bottlenecks.
- ISSTA'13 Context-Sensitive Delta Inference for Identifying Workload-Dependent Performance Bottlenecks.
- Security'13 WHYPER: Towards Automating Risk Assessment of Mobile Applications.
- ASE'13 Characteristic Studies of Loop Problems for Structural Test Generation via Symbolic Execution.
- ICSE'12 Inferring Method Specifications from Natural Language API Descriptions.
- FSE'12 Automated Extraction of Security Policies from Natural-Language Software Documents.
- ICSE'11 Precise Identification of Problems for Structural Test Generation.
- ICSE'11 Covana: Precise Identification of Problems in Pex.

Teaching Experience

SUMMARY OF TEACHING

- Undergraduate Courses Taught: 4
- Graduate Courses Taught: 4
 - New Graduate Course Development: 1
- Average Teaching Evaluation Score for Undergraduate Courses taught at ASU: 4.5
- Average Teaching Evaluation Score for Graduate Courses taught at ASU: 4.5

Teaching at ASU (G=Graduate, U=Undergraduate):

Semester/Year	Course Number	Course Title	Level	Enrollment	Rating (0-5)	
					Instructor	Course
Fall 2024	CSE 464	Software Quality Assurance and Testing	U	128	4.62	4.45
Fall 2023	CSE 464	Software Quality Assurance and Testing	U	140	4.55	4.44
Spring 2023	CSE 464	Software Quality Assurance and Testing	U	137	4.35	4.24
Fall 2022	CSE 545	Software Security	G	146	4.50	4.45

Average Enrollment: 138, Average Rating for Instructor: 4.51, Average Rating for Course: 4.48

Teaching at CWRU (G=Graduate, U=Undergraduate):

Semester/Year	Course Number	Course Title	Level	Enrollment	Rating (0-5)	
					Instructor	Course
Spring 2022	CSDS 393/493	Software Engineering	U	67	3.50	3.83
Fall 2021	CSDS 344/444	Computer Security	U	97	3.68	3.53
Fall 2021	CSDS 448	Smartphone Security	G	3	5.00	5.00
Spring 2021	CSDS 393/493	Software Engineering	G	103	3.86	3.91
Spring 2021	CSDS 448	Smartphone Security	G	49	4.25	4.25
Fall 2020	CSDS 344/444	Computer Security	U	99	3.94	3.83
Spring 2020	EECS 448	Smartphone Security	G	25	4.71	4.43
Fall 2019	EECS 341	Introduction to Database Systems	U	80	3.46	3.35
Spring 2019	EECS 448	Smartphone Security	G	27	4.33	4.22
Fall 2018	EECS 344/444	Computer Security	U	60	3.59	3.76
Spring 2018	EECS 600	Smartphone Security	G	17	–	–
Fall 2017	EECS 341	Introduction to Database Systems	U	39	3.62	3.62

Average Enrollment: 55.75, Average Rating for Instructor: 3.99, Average Rating for Course: 3.98

Curriculum Development:

- Fall 2024 CSE 598 Mobile Security, ASU
- Fall 2021 CSDS 448 Smartphone Security (Required in Online CS Master Curriculum), CWRU
- Spring 2019 EECS 448 Smartphone Security (Required in CS Graduate Curriculum), CWRU

Students

SUMMARY OF MENTORING (including Co-Mentored Personnel)

- Ph.D. Students Graduated: 2
- Ph.D. Students Current: 6
- M.S. Thesis Students Graduated: 14
- M.S. Thesis Students Current: 0
- M.S. Project Students Graduated: 1
- Intern students (Research): 9
- Undergraduate Students (Research): 17
- High-School Students (Research): 1

Graduated PhD Students

- 2018 – 2023 **Pengcheng Fang**, CWRU [C38, C37, C41, C46]
 - Topic: A Systematic Framework to Automatically Secure, Test, and Utilize Smart Contracts
- 2018 – 2023 **Yang Shao**, CWRU [C28, C39, C52]
 - Topic: Enhancing Smartphone App Security through Contextual Integrity and User Awareness
 - ASE Student Research Competition 2019, poster presentation

Current PhD Students

- 2020 – NOW **Liangyi Huang**, ASU, expected 2025 [C45, W12, C48]
 - Topic: Enhancing Cyber Threat Investigation through Cyber Threat Intelligence
- 2023 – NOW **Zichen Liu**, ASU, expected 2028
- 2024 – NOW **Weiyu Chen**, ASU, expected 2029
- 2022 – NOW **Shang Ma**, Notre Dame, co-advised with Yanfang (Fanny) Ye, expected 2027 [C52, I5]
 - Topic: Mobile Ad Promotion Network Study
- 2019 – NOW **Fei Shao**, CWRU, expected 2025 [C34, C32, W11, W12, C43, ??, C49]
 - Topic: Detecting Semantic Structure Changes for Web Application Evolution
 - Topic: Dependency Graph Query for Cyber Attack Investigation on System Audit Logs
 - ICSE Student Research Competition 2021, poster presentation
- 2020 – NOW **Changlin Liu**, CWRU, expected 2024 [C25, C38, C37, C40]
 - Topic: Improving Automated Testing for Smartphone Apps via Synergy of Program Analysis and Machine Learning
 - Topic: Mining Open-Source Threat Intelligence for Attack Investigation
 - ICSE Student Research Competition 2021, poster presentation
 - CWRU Institute for Smart, Secure and Connected Systems (ISSACS) Student Fellowship

PhD Committee

- 2025 – NOW **Chang Zhu**, ASU
- 2025 – NOW **Wangyang Ying**, ASU

Master Students

- 2023 – 2024 **Rachel Guzman**, ASU

- Thesis: x86 Instruction Set Architecture (ISA) Correctness and Its Security Consequences
- 2023 **Viraj Thakkar**, ASU, co-advised with Zhichao Cao
 - Thesis: Optimizing Consistency and Performance Trade-off in Distributed Log-Structured Merge-Tree-based Key-Value Stores
- 2024 **Saif Masood**, ASU, committee member
 - Thesis: Accelerating Deep Learning Inference in Relational Database Systems
- 2023 **Swapnil Kumbhar**, ASU, committee member
 - Thesis: Analyzing the Impact of Software Configurations on Dynamic Code Coverage
- 2023 – NOW **Santosh Gokul Narayanan**, ASU, committee member
 - Thesis: Accelerating Deep Learning Inference in Relational Database Systems
- 2021 – 2022 **Sophia Hall**, CWRU [W12]
 - Thesis: System-Auditing, Data Analysis and Characteristics of Cyber Attacks for Big Data Systems
- 2021 – 2022 **Zhou Yang**, CWRU
 - Thesis: Detecting Software Crashes due to Third-party Libraries
- 2018 – 2022 **Hanlin Wang**, CWRU [C26, C40]
 - Thesis: Automatic Identification of Sensitive UI Widgets based on Icon Classification for Android Apps
- 2017 – 2018 **Pengcheng Fang**, CWRU
 - Thesis: RepTracker: Towards Automatic Attack Investigation
- 2018 – 2020 **Changlin Liu**, CWRU [C25]
 - Thesis: Root Cause Localization For Unreproducible Builds
- 2018 – 2020 **Jian Shi**, CWRU [C27]
 - Thesis: HyperService Language: A High-Level Programming Language for Cross-Chain Decentralized Applications
- 2018 – 2020 **Rui Xu**, CWRU [C34]
 - Thesis: Taming Web Application Evolution via Semantic Change Detection
- 2018 – 2020 **Siyi Chen**, CWRU
 - Thesis: Open-Source Cyber Threat Intelligence: Characterization and Classification
- 2018 – 2020 **Tiantong Ji**, CWRU [C33]
 - Thesis: Detecting Market Policy Violations from User Comments for Android Apps
- 2019 – 2020 **Chongbin Tang**, Visiting Student from East China Normal University
 - Thesis: Measuring User Credibility from User Comments for Android Apps
- 2018 – 2019 **Jing Sui**, CWRU
 - Thesis: Sensitive Image Icon for Android Applications: Characterization and Classification
- 2018 **Junqi Ma** (co-advised with Andy Podgurski), CWRU
 - Thesis: Stitching Dynamic Call Graphs for Debugging Android Applications
- 2017 **Zhihao Cao**, CWRU [C26]
 - Thesis: Sensitive Text Icon Classification for Android Apps

Undergraduate Students

- 2024 – NOW **Ian Johnson**, ASU
 - Barrett Honors Thesis: Combining System Auditing and Network Traffic Analysis to Detect Malicious Activity
- 2023 **Ahmed Abdelrazek**, ASU, NSF REU

- 2023 **Yi Lang Liu**, ASU
 2023 **Kimberly Gehrmann**, ASU, NSF REU
 2023 **Shakib Ahmed**, ASU
 2023 **Lilian Weng**, ASU, NSF REU
 2023 **Baozan Yan**, ASU
 2021 **Alexander Rambasek**, CWRU, NSF REU
 2021 **Jacob Prusky**, CWRU, NSF REU
 2021 **Xuanzhi Lin**, CWRU
 2021 **Yuanyuan Huang**, University of Electronic Science and Technology , China [??]
 2020 **Rishik Hombal**, CWRU, NSF REU
 2020 **Tevin McDowell**, CWRU, NSF REU
 2020 **Randolph Zhao**, CWRU
 2020 **Yuehan Wang**, Nanjing University, China [C39]
 2019 **Mei Wong**, CWRU, NSF REU
 2017 – 2019 **Taylor Smith**, CWRU, Support of Undergraduate Research and Creative Endeavors (SOURCE) Fellowship

Intern Students mentored in NEC Labs

- 2016 – 2019 **Peng Gao**, Princeton University [C20, C21, C32, C28, C27, C33, C26, C37] , **Now Assistant Professor at Virginia Tech**
 2016 **Yutao Tang**, College of William and Mary [C19]
 2016 **Jiaping Gui**, University of Southern California [C23, C31]
 2015 **Weiren Wang**, Georgia Institute of Technology
 2015 **Kangjie Lu**, Georgia Institute of Technology
 2015 **Gensheng Zhang**, University of Texas at Arlington
 2014 **Bo Zong**, University of California, Santa Barbara [C14]
 2014 **Jianjun Huang**, Purdue University [C11]
 2014 – 2015 **Zhang Xu**, College of William and Mary [C13]

High School Students

- 2019 – 2020 **Alan Han**, Solon High School, OH
 - Superior/Excellent Ratings at the Ohio Regional/State Science Fairs
 - First Prize in “Wasmer, Schroeder & Company Award” at Ohio State

Professional Activities

SUMMARY OF PROFESSIONAL ACTIVITIES AND SERVICE

- International/national conferences chaired: 3
- International/national conferences committees: 53
- International/national conference sessions chaired: 4
- Peer Reviewer for 14 Journals
- Proposal Review Service for 2 Funding Agencies
- 3 Unit-level Committees
- Committees Chair of 1 Faculty Search Committees

External Services

Top Conferences in Computer Science Are Shown in Bold

PC Co-Chair	International Conference on Automated Software Engineering (ASE) , New Ideas and Emerging Results (NIER) Track, 2025
PC Co-Chair	The 1st International Workshop on Large Language Model Supply Chain Analysis (LLMSC) , 2025
PC Member	International Conference on Software Engineering (ICSE) , 2026
PC Member	IEEE Symposium on Security and Privacy (IEEE S&P) , 2025
PC Member	ACM Conference on Computer and Communications Security (CCS) , 2025
PC Member	International Symposium on Software Testing and Analysis (ISSTA) , 2025
PC Member	ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE) , 2025
PC Member	ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE) , Industry Track, 2025
PC Member	International Conference on Software Engineering (ICSE) , 2025
PC Member	International Conference on Automated Software Engineering (ASE) , 2025
PC Member	The Web Conference (WWW) , 2025
PC Member	Privacy Enhancing Technologies Symposium (IEEE PETS) , 2025
PC Member	IEEE International Conference on Distributed Computing Systems (ICDCS) , 2025
PC Member	IEEE Symposium on Security and Privacy (IEEE S&P) , 2024
PC Member	ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE) , 2024
PC Member	International Conference on Automated Software Engineering (ASE) , 2024
PC Member	International Symposium on Software Testing and Analysis (ISSTA) , 2024
PC Member	Privacy Enhancing Technologies Symposium (IEEE PETS) , 2024
PC Member	The Web Conference (WWW) , 2024
PC Member	ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE) , Industry Track, 2024
PC Member	IEEE Symposium on Security and Privacy (IEEE S&P) , 2023
PC Member	ACM Conference on Computer and Communications Security (CCS) , 2023
PC Member	International Conference on Automated Software Engineering (ASE) , 2023
PC Member	ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) , Industry Track, 2023
PC Member	IEEE International Conference on Distributed Computing Systems (ICDCS) , 2023
PC Member	IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER) , 2023
PC Member	ACM Conference on Computer and Communications Security (CCS) , 2022
PC Member	International Conference on Automated Software Engineering (ASE) , 2022
PC Member	IEEE International Conference on Distributed Computing Systems (ICDCS) , 2022
PC Member	International Conference on Software Testing, Verification and Validation (ICST) , 2022
PC Member	International Conference on Software Testing, Verification and Validation (ICST) , Industrial Track, 2022
PC Member	IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER) , 2022

PC Member	USENIX Security Symposium , 2021
PC Member	International Conference on Software Engineering (ICSE) , 2021
PC Member	International Conference on Automated Software Engineering (ASE) , 2021
PC Member	International Symposium on Software Testing and Analysis (ISSTA) , 2021
PC Member	International Conference on Software Testing, Verification and Validation (ICST), 2022
PC Member	IEEE International Conference on Distributed Computing Systems (ICDCS) , 2021
PC Member	ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) , Industry Track, 2021
PC Member	ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) , Ideas, Visions and Reflections Track (FSE-IVR), 2021
Panelist	National Science Foundation (NSF) SHF, 2021
PC Member	ACM Conference on Computer and Communications Security (CCS) , 2020
PC Member	International Conference on Automated Software Engineering (ASE) , 2020
PC Member	International Conference on Automated Software Engineering (ASE) , 2019
PC Member	International Conference on Software Engineering (ICSE) , Artifacts Evaluation, 2019
PC Member	The Thirteenth International Conference on Software Engineering Advances (ICSEA), 2019
Expert Review	Natural Sciences and Engineering Research Council of Canada (NSERC) in the Canada - Germany 2 + 2 call on Advanced Manufacturing - Industry 4.0, 2018
Organization Committee	The 1st Radical and Experiential Security Workshop (RESEC), 2018
Panelist	National Science Foundation (NSF) SaTC, 2018
PC Member	ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) , Demo Track, 2018
PC Member	The Thirteenth International Conference on Software Engineering Advances (ICSEA), 2018
PC Member	Symposium and Bootcamp on the Science of Security (HotSoS), 2018
Guest Editor	Journal of Computer Science and Technology (JCST) Special Section on Software Systems, 2016
PC Member	International Conference on Software Engineering (ICSE) , Software Engineering in Practice (SEIP) Track, 2016
PC Member	International Conference on Software Testing, Verification and Validation (ICST), Testing Tool Demo Track, 2016
PC Member	International Conference on Software Engineering (ICSE) , Demo Track, 2015
PC Member	International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA) , Artifact Evaluation, 2014
PC Member	International Symposium on Software Testing and Analysis (ISSTA) , Artifact Evaluation, 2014
PC Member	International Workshop on Software and System Performance Testing, Debugging, and Analytics (PERTEA), 2014

Journal Reviewer

Reviewer	Transactions on Software Engineering and Methodology (TOSEM)
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- Distinguished Reviewer, 2020

Reviewer	IEEE Transactions on Software Engineering (TSE)
Reviewer	Empirical Software Engineering (EMSE)
Reviewer	IEEE's Transactions on Dependable and Secure Computing (TDSC)
Reviewer	ACM Transactions on Information and System Security (TISSEC)
Reviewer	IEEE Transactions on Mobile Computing (TMC)
Reviewer	Transactions on Embedded Computing Systems (TECS)
Reviewer	ACM Transactions on Information Systems (TOIS)
Reviewer	ACM Transactions on Internet Technology (TOIT)
Reviewer	Science of Computer Programming (SCP) Journal
Reviewer	PLOS ONE
Reviewer	Journal of Systems and Software (JSS)
Reviewer	Journal of Computer Science and Technology (JCST)
Reviewer	Journal of Information Security and Applications (JISA)

Internal Services

Member	CSE 360 Software Engineering Curriculum Update, School of Computing and Augmented Intelligence, ASU, 2024-2025
Chair	Programming Languages, Compilers and OS for Emerging Architectures Faculty Search Chair, School of Computing and Augmented Intelligence, ASU, 2023-2024
Member	Smart Data Engineering Faculty Search Committee, School of Computing and Augmented Intelligence, ASU, 2022-2023
Member	Graduate Admission Committee, School of Computing and Augmented Intelligence, ASU, 2022-2023
Chair	Colloquium/Distinguished Speaker Series, Department of Computer and Data Sciences, CWRU, 2021-2022
Member	Colloquium/Distinguished Speaker Series, Department of Computer and Data Sciences, CWRU, 2020-2021
Member	Graduate Program Affairs, Department of Computer and Data Sciences, CWRU, 2021
Member	Graduate Program Affairs, Department of Computer and Data Sciences, CWRU, 2020
Member	Department Chair Search Committee, Department of Electrical Engineering and Computer Science, CWRU, 2019
Member	Faculty Search Committee, Department of Electrical Engineering and Computer Science, CWRU, 2019
Member	Faculty Search Committee, Department of Electrical Engineering and Computer Science, CWRU, 2018
Member	Faculty Search Committee, Department of Electrical Engineering and Computer Science, CWRU, 2017