Tiffany Bao

CONTACT INFORMATION

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Arizona State University
Tempe, AZ 85281
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PROFESSIONAL APPOINTMENTS

Assistant Professor, Arizona State University 2018 – present

EDUCATION

Doctor of Philosophy, Carnegie Mellon University 2012 – 2018

Department of Electrical and Computer Engineering

PUBLICATIONS

AirTaint: Making Dynamic Taint Analysis Faster and Easier.
Qian Sang, Yanhao Wang, Yuwei Liu, Xiangkun Jia, Tiffany Bao, Purui Su.
To appear in *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '24)*.

AFGen: Whole-Function Fuzzing for Applications and Libraries.
Yuwei Liu, Yanhao Wang, Tiffany Bao, Xiangkun Jia, Zheng Zhang, Purui Su.
To appear in *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '24)*.

RetSpill: Igniting User-Controlled Data to Burn Away Linux Kernel Protections.
Kyle Zeng, Zhenpeng Lin, Kangjie Lu, Xinyu Xing, Ruoyu Wang, Adam Doupé, Yan Shoshitaishvili, Tiffany Bao.
In *Proceedings of the 2023 ACM SIGSAC Conference on Computer and Communications Security (CCS '23)*.

Greenhouse: Single-Service Rehosting of Linux-Based Firmware Binaries in User-Space Emulation.
Hui Jun Tay, Kyle Zeng, Jayakrishna Menon Vadayath, Arvind S Raj, Audrey Dutcher, Tejesh Reddy, Wil Gibbs, Zion Leonahenahe Basque, Fangzhou Dong, Zack Smith, Adam Doupé, Tiffany Bao, Yan Shoshitaishvili, Ruoyu Wang.
In *the 32nd USENIX Security Symposium (USENIX '23)*.

BEYOND PHISH: Toward Detecting Fraudulent e-Commerce Websites at Scale.

Marzieh Bitaab, Haehyun Cho, Adam Oest, Zhuoer Lyu, Wei Wang, Jorij Abraham, Ruoyu Wang, Tiffany Bao, Yan Shoshitaishvili, Adam Doupé.
In *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '23)*.

Toss a Fault to Your Witcher: Applying Grey-box Coverage-guided Mutational Fuzzing to Detect SQL and Command Injection Vulnerabilities.
Erik Trickel, Fabio Pagani, Chang Zhu, Lukas Dresel, Giovanni Vigna, Christopher Kruegel, Ruoyu Wang, Tiffany Bao, Yan Shoshitaishvili, Adam Doupé.
In *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '23)*.

Cyber Deception: Techniques, Strategies, and Human Aspects.
Tiffany Bao, Milind Tambe, Cliff Wang.
Springer Nature.

Mitigating Threats Emerging from the Interaction between SDN Apps and SDN (Configuration) Datastore.
Sana Habib, Tiffany Bao, Yan Shoshitaishvili, Adam Doupé.
Proceedings of the 2022 on Cloud Computing Security Workshop.

Playing for K(H)eaps: Understanding and Improving Linux Kernel Exploit Reliability.
Kyle Zeng, Yueqi Chen, Haehyun Cho, Xinyu Xing, Adam Doupé, Yan Shoshitaishvili, Tiffany Bao.
In *the 31st USENIX Security Symposium (USENIX '22)*.

Arbiter: Bridging the Static and Dynamic Divide in Vulnerability Discovery on Binary Programs.
Jayakrishna Vadayath, Moritz Eckert, Kyle Zeng, Nicolaas Weideman, Gokulkrishna Praveen Menon, Yanick Fratantonio, Davide Balzarotti, Adam Doupé, Tiffany Bao, Ruoyu Wang, Christophe Hauser, Yan Shoshitaishvili.
In *the 31st USENIX Security Symposium (USENIX '22)*.

Expected Exploitability: Predicting the Development of Functional Vulnerability Exploits.
Octavian Suciu, Connor Nelson, Zhuoer Lyu, and Tiffany Bao, Tudor Dumitraş.
In *the 31st USENIX Security Symposium (USENIX '22)*.

"Flawed, but like democracy we don't have a better system": The Experts' Insights on the Peer Review Process of Evaluating Security Papers.
Ananta Soneji, Faris Bugra Kokulu, Carlos Rubio-Medrano, Tiffany Bao, Ruoyu

Wang, Yan Shoshitaishvili, Adam Doupe.
In *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '22).*

ViK: practical mitigation of temporal memory safety violations through object ID inspection.
Haehyun Cho, Jinbum Park, Adam Oest, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn.
Proceedings of the 27th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '22).

Favocado: Fuzzing Binding Code of JavaScript Engines Using Semantically Correct Test Cases.
Sung Ta Dinh, Haehyun Cho, Kyle Martin, Adam Oest, Yihui Zeng, Alexandros Kapravelos, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn.
In *Network and Distributed System Security Symposium (NDSS '21).*

Having Your Cake and Eating It: An Analysis of Concession-Abuse-as-a-Service
Zhibo Sun, Adam Oest, Penghui Zhang, Carlos Rubio-Medrano, Tiffany Bao, Ruoyu Wang, Ziming Zhao, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn.
In *the 30th USENIX Security Symposium (USENIX '21).*

CrawlPhish: Large-scale Analysis of Client-side Cloaking Techniques in Phishing.
Penghui Zhang, Adam Oest, Haehyun Cho, Zhibo Sun, RC Johnson, Brad Wardman, Shaown Sarker, Alexandros Kapravelos, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn.
In *Proceedings of the IEEE Symposium on Security and Privacy (Oakland '21).*

SyML: Guiding Symbolic Execution Toward Vulnerable States Through Pattern Learning.
Nicola Ruaro, Kyle Zeng, Lukas Dresel, Mario Polino, Tiffany Bao, Andrea Continella, Stefano Zanero, Christopher Kruegel, Giovanni Vigna.
In *the 24th International Symposium on Research in Attacks, Intrusions and Defenses (RAID '21).*

SoK: Everything You Ever Wanted to Know About Bitcoin Mixers (But Were Afraid to Ask)
Jaswant Pakki, Yan Shoshitaishvili, Ruoyu Wang, Tiffany Bao, Adam Doupé.
In *Financial Cryptography and Data Security (FC '21).*

MuTent: Dynamic Android Intent Protection with Ownership-Based Key Distribution and Security Contracts.
Pradeep Kumar Duraisamy Soundrapandian, Jaejong Baek, Tiffany Bao, Yan Shoshitaishvili, Adam Doupé, Ruoyu Wang, Gail-Joon Ahn.
In *Hawaii International Conference on System Sciences (HICCS '21)*.
Best Minitrack Paper Award.

HoneyPLC: A Next-Generation Honeypot for Industrial Control Systems
Efren López-Morale, Carlos Rubio-Medrano, Adam Doupé, Yan Shoshitaishvili, Ruoyu Wang, Tiffany Bao, Gail-Joon Ahn.
In *Proceedings of the 2020 ACM SIGSAC Conference on Computer and Communications Security (CCS '20)*.

Exploiting Uses of Uninitialized Stack Variables in Linux Kernels to Leak Kernel Pointers.
Haehyun Cho, Jinbum Park, Joonwon Kang, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn.
In *the 14th USENIX Workshop on Offensive Technologies (WOOT '20)*.

Not All Coverage Measurements Are Equal: Fuzzing by Coverage Accounting for Input Prioritization.
Yanhao Wang, Xiangkun Jia, Yuwei Liu, Tiffany Bao, Dinghao Wu, and Purui Su.
In the *Network and Distributed System Security Symposium (NDSS '20)*.

Scam Pandemic: How Attackers Exploit Public Fear through Phishing.
Marzieh Bitaab, Haehyun Cho, Adam Oest, Penghui Zhang, Zhibo Sun, Rana Pourmohamad, Doowon Kim, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, Gail-Joon Ahn. In *Symposium on Electronic Crime Research (ECrime '20)*.

Cyber Autonomy in Software Security: Techniques and Tactics (Book Chapter).
Tiffany Bao and Yan Shoshitaishvili.
In *Game Theory and Machine Learning for Cyber Security*.

Matched and Mismatched SOCs: A Qualitative Study on Security Operations Center Issues.
Faris Bugra Kokulu, Ananta Soneji, Tiffany Bao, Yan Shoshitaishvili, Ziming

Zhao, Adam Doupé, and Gail-Joon Ahn.
In *Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security (CCS '19).*

Understanding and Predicting Private Interactions in Underground Forums.
Zhibo Sun, Carlos E. Rubio-Medrano, Ziming Zhao, Tiffany Bao, Adam Doupé, and Gail-Joon Ahn.
In *the 9th ACM Conference on Data and Application Security and Privacy (CODASPY '19).*

Your Exploit is Mine: Automatic Shellcode Transplant for Remote Exploits.
Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, and David Brumley.
In *Proceedings of the 38th IEEE Symposium on Security and Privacy (Oakland '17).*

How Shall We Play a Game: A Game-theoretical Model for Cyber-warfare.
Tiffany Bao, Yan Shoshitaishvili, Ruoyu Wang, Christopher Kruegel, Giovanni Vigna and David Brumley.
In *Proceedings of the 30th IEEE Computer Security Foundations (CSF '17).*
National Security Agency's Annual Scientific Paper Award.

Security is a Game.
Tiffany Bao.
In *2017 USENIX Summit on Hot Topics in Security (HotSec '17).*
Awarded Talk.

A Game-theoretical Model for Cyber-warfare Games. (Invited Poster)
Tiffany Bao, Yan Shoshitaishvili, Ruoyu Wang and David Brumley.
In *the 8th Workshop on Computational Cybersecurity in Compromised Environments (C3E '16).*

ByteWeight: Learning to Recognize Functions in Binary Code.
Tiffany Bao, Jonathan Burket, Maverick Woo, Rafael Turner, and David Brumley.
In *Proceedings of the 23rd USENIX Security Symposium (USENIX '14).*

Type-based Dynamic Taint Analysis Technology.
Libo Chen, Jianwei Zhuge, Fan Tian, Tiffany Bao, and Xun Lu. In *Tsinghua Science and Technology Journal*, 2012.

Research of Technology for Type-based Dynamic Taint Analysis.
Libo Chen, Jianwei Zhuge, Fan Tian, Tiffany Bao, and Xun Lu. In *Proceedings of the 5th Conference of Vulnerability Analysis and Risk Assessment (VARA '12).*
Outstanding Paper Award.

Professional Activities

Chair Member

Network and Distributed System Security Symposium Poster Session. 2023, 2024
USENIX Security. 2024
IEEE Security and Privacy. 2024

Program Committee Member

Network and Distributed System Security Symposium. 2019 - 2023
ACM SIGSAC Conference on Computer and Communications Security. 2020, 2022-2024
IEEE Security and Privacy. 2022, 2023
USENIX Security. 2022
International Symposium on Research in Attacks, Intrusions and Defenses. 2020
ACM Workshop on Automotive and Aerial Vehicle Security. 2020
(Affiliated with the ACM Conference on Data and Application Security and Privacy.)
Network and Distributed System Security Symposium. 2019
Annual Computer Security Applications Conference. 2019
Workshop on Binary Analysis Research. 2018, 2019, 2020
(Affiliated with the Network and Distributed System Security Symposium.)

Journal Editorial Board

The Journal of Systems Research, Security Track.

Journal Reviewer

ACM Transactions on information and System Security.
Communications of the ACM.
IEEE Transactions on Software Engineering.
IEEE Transactions on Knowledge and Data Engineering.

CTF Game Organizer

Member of the DEF CON CTF hosting team. 2019 - 2021

Mentor

	Google Summer of Code.	2013
Selected Awards	IEEE Security and Privacy Best Student Paper Award.	2020
	National Security Agency's Annual Scientific Paper Award.	2018
	Awarded Talk at 2017 USENIX Summit on Hot Topics in Security.	2017
	Carnegie Mellon University Presidential Fellowship.	2017
Teaching Experience	CSE 365: Introduction to Information Assurance.	2021, 2022
	CSE 545: Software Security.	2020
	CSE 591: Computer Security: Techniques and Tactics.	2019