Zion Leonahenahe Basque

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Arizona State University

Education

2021–2026* **Ph.D. in Computer Science**
Arizona State University
Advisors: Ruoyu "Fish" Wang and Yan Shoshitaishvili
Thesis: Toward Automated Software Understanding and Reverse Engineering

2024 **M.S. in Computer Science**
Arizona State University

2017–2020 **B.S. in Computer Science**
Arizona State University

Publications

Peer-reviewed Conference Proceedings

[C1] Irina Ford, Ananta Soneji, Faris Bugra Kokulu, Jayakrishna Vadayath, **Zion Leonahenahe Basque**, Gaurav Vipat, Adam Doupé, Ruoyu Wang, Gail-Joon Ahn, Tiffany Bao, *et al.*, ""watching over the shoulder of a professional": Why hackers make mistakes and how they fix them," in *Proceedings of the 45th IEEE Symposium on Security and Privacy*, IEEE, 2024. (**17.8%** acceptance rate.)

[C2] Wil Gibbs, Arvind S Raj, Jayakrishna Menon Vadayath, Hui Jun Tay, Justin Miller, Akshay Ajayan, **Zion Leonahenahe Basque**, Audrey Dutcher, Fangzhou Dong, Xavier Maso, *et al.*, "Operation mango: Scalable discovery of taint-style vulnerabilities in binary firmware services," in *Proceedings of the 33rd USENIX Security Symposium*, 2024. (**18.32%** acceptance rate.)

[C3] Kuntal Kumar Pal, Ati Priya Bajaj, Pratyay Banerjee, Audrey Dutcher, Mutsumi Nakamura, **Zion Leonahenahe Basque**, Himanshu Gupta, Saurabh Arjun Sawant, Ujjwala Anantheswaran, Yan Shoshitaishvili, Adam Doupé, Chitta Baral, and Ruoyu Wang, ""len or index or count, anything but v1": Predicting variable names in decompilation output with transfer learning," in *Proceedings of the 45th IEEE Symposium on Security and Privacy*, 2024. (**17.8%** acceptance rate.)

[C4] **Zion Leonahenahe Basque**, Ati Priya Bajaj, Wil Gibbs, Jude O'Kain, Derron Miao, Tiffany Bao, Adam Doupé, Yan Shoshitaishvili, and Ruoyu Wang, "Ahoy sailr! there is no need to dream of c: A compiler-aware structuring algorithm for binary decompilation," in *Proceedings of the 33rd USENIX Security Symposium*, 2024. (**18.32%** acceptance rate.)

*Expected.

[C5] 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, and Ruoyu Wang, "Greenhouse: Single-service rehosting of linux-based firmware binaries in user-space emulation," in *Proceedings of the 32nd USENIX Security Symposium*, 2023. (**29.2%** acceptance rate.)

[C6] Penghui Zhang, Zhibo Sun, Sukwha Kyung, Hans Behrens, **Zion Leonahenahe Basque**, Haehyun Cho, Adam Oest, Ruoyu Wang, Tiffany Bao, Yan Shoshitaishvili, Gail-Joon Ahn, and Adam Doupé, "I'm spartacus, no, i'm spartacus: Proactively protecting users from phishing by intentionally triggering cloaking behavior," in *Proceedings of the 2022 ACM Conference on Computer and Communications Security*, 2022. (**22.4%** acceptance rate.)

Working papers

[W1] Muqi Zou, Hongyu Cai, Hongwei Wu, **Zion Leonahenahe Basque**, Arslan Khan, Berkay Celik, Antonio Bianchi, Dongyan Xu, *et al.*, *D-lift: Improving llm-based decompiler backend via code quality-driven fine-tuning*, (In submission), 2025.

Invited Talks & Presentations

Invited Talks

[T1] *Artiphishell intelligence and llm autonomy in patching.* **Microsoft Security**, 2025.

[T2] *Buccaneers of the binary: Plundering compiler optimizations for decompilation treasure.* **Reverse Conference**, 2025.

[T3] *Falling in love with ctfs: Lessons from shellphish in love and loss.* **United States Cyber Games**, **Keynote**, 2025.

[T4] *Artiphishell intelligence: Advancing autonomous software security with ai.* **Oracle**, 2024.

[T5] *Improving the understanding of software through human-centric decompilation.* **University of Hawaii, Manoa**, 2024.

[T6] *Toward human-centric decompilation.* **NSA Research**, 2024.

[T7] *Bridging the gap in the static and dynamic analysis of binaries through decompiler tomfoolery.* **CactusCon**, 2023.

[T8] *Modern approaches in human-centric decompilation.* **Ohio State University**, 2023.

[T9] *Your teammate isn't human! mixing decompilation and ai for modern reverse engineering.* **HITCON, Taiwan**, **Keynote**, 2023.

Panels

[L1] *Beyond decompilation: Multi-level lifting for automatic software understanding.* **REcon, Québec, Canada**, **Panelist**, 2025.

Posters

[P1] *Goal-oriented binary decompilation is key to understanding complex binary programs.* **Software for National Security Partnership Forum**, 2025.

Demonstrations

[D1] *Binsync: Automatic lifting of cross-analyses binary data.* **USENIX WOOT Conference on Offensive Technologies**, 2024.

Academic Service

Program Committee

2026	Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA)
2026	USENIX WOOT Conference on Offensive Technologies
2025	USENIX WOOT Conference on Offensive Technologies

Reviewer

2025	ACM Transactions on Privacy and Security (TOPS)
2025	Expert Systems with Applications Journal

Conference & Workshop Organization

2025	**Founding Program Chair**, ACM CCS Workshop on Software Understanding and Reverse Engineering (SURE)
2025	**CTF Committee Chair**, Annual Computer Security Applications Conference (ACSAC)
2024	**CTF Committee**, Annual Computer Security Applications Conference (ACSAC)

Industry Experience

2019	*Fuzzing Research Intern*, Mayhem Security Developed fuzzing synchronization systems to discover vulnerabilities autonomously. Discovered two zero-days in Netflix and bootloader software.

Teaching

Arizona State University

2025	**Instructor**, Cybersecurity History and Culture (CSE 194); 31 students. Designed syllabus; authored new lectures and assignments; coordinated two external invited speakers.
2021	**Teaching Assistant & Platform Developer**, Systems Security (CSE 466); 106 students. Developed two pwn.college chapters used across U.S. universities; supported instruction.

2020 **Teaching Assistant**, Software Security (CSE 545); 112 students. Developed new assignments; supported instruction and course operations.

Honors & Awards

2025 **Defense Advanced Research Projects Agency (DARPA)** AI Cyber Challenge Finalist (**$3 million** award)
2022 **National Science Foundation** Graduate Research Fellowship, Honorable Mention
2021 **Arizona State University** Dean's Fellowship
2021 **Computing Research Association** Undergraduate Research Award, Honorable Mention
2020 **Arizona State University** Graduate Impact Award
2017–2023 **Private & Public Scholarships**
Center for Cyber Safety and Education, APIA/Coca-Cola Foundation, Pauahi Foundation, Hawaii Community Foundation THINK, Hokuli'a Foundation, David and Julia Desha Foundation (**$171k** in awards)

Selected Media Coverage

2024 **Fox 10 News**, "ASU students win $2M in cybersecurity competition"
2024 **The Washington Post**, "Hackers race to win millions in contest to thwart cyberattacks with AI"
2021 **Computing Research Association**, "From CTF to PhD: Hacker turned Security Researcher"
2021 **Arizona State University**, "Cybersecurity competition challenges next generation of security experts"
2021 **Amazon Prime Video**, "The College Tour Season 1: Arizona State University"

Other Experience

- **Co-captain, Shellphish** (2020–2023), the oldest ethical hacking team in the U.S.; competed in 124+ 48-hour CTFs and organized two editions of iCTF with 200 teams worldwide.
- **Led ASU technical teams on DARPA programs** as technical lead for AMP and FIRE (2024); contributor to HACCS and CHESS.
- **Created and maintain open-source security tools** adopted by the community: BinSync, DAILA, decomp2dbg; maintainer of the angr decompiler. Accumulated 3k+ GitHub stars; hundreds of installs per day.
- **Led autonomous vulnerability patching team** for Shellphish's DARPA AIxCC submission; placed 5th overall and built the competition's most accurate patching system.