Zion Leonahenahe Basque

Ph.D. Computer Science Student

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Tempe, Arizona

Education

Arizona State University — Tempe, AZ
Ph.D. in Computer Science, Security (expected), GPA: 4.00 — Fall 2021–

Arizona State University — Tempe, AZ
B.S. in Computer Science, GPA: 4.00 — Fall 2017–Fall 2020

- Capstone: "Semantic Fuzzing of Autonomous Systems"

Research Experience

Arizona State University, SEFCOM Lab — Tempe, AZ
Senior Cybersecurity Research Assistant — 2017–Pres.

- Advisers: Dr. Ruoyu "Fish" Wang, Dr. Yan Shoshitaishvili
- Research Topics: Binary Analysis, Reverse Engineering, Decompilation

ForAllSecure — Palo Alto, CA
Fuzzing Research Intern — Summer 2019

- Worked in a team of two; Vulnerability discovery on open-source projects
- Lead development on Fuzzer seed sharing system (2k LoC Python)
- Development on the Mayhem Fuzzing System; Continuous Fuzzing

Arizona State University, Fulton Schools — Tempe, AZ
Fulton Undergraduate Researcher — Fall 2018, Fall 2020

- Machine Learning Applied to Fuzzing Mutation Strategies
- Advanced CFG Recovery of Binaries

Teaching

- **Instructor, Cybersecurity History and Culture** — Spring 2025
  Arizona State University (CSE 194)
- **Teaching Assistant, Systems Security** — Fall 2021
  Arizona State University (CSE 466/pwn.college), Dr. Yan Shoshitaishvili
- **Teaching Assistant, Software Security** — Fall 2020
  Arizona State University (CSE 545), Dr. Tiffany Bao

Publications

1. **Zion Leonahenahe Basque**, Ati Priya Bajaj, Wil Gibbs, Jude O'Kain, Derron Miao, Tiffany Bao, Adam Doupé, Yan Shoshitaishvili, Ruoyu Wang. Ahoy SAILR! There is No Need to DREAM of C: A Compiler-Aware Structuring Algorithm for Binary Decompilation. In *Proceedings of the USENIX Security Symposium*, 2024.

2. 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, Ruoyu Wang. "Len or index or count, anything but v1": Predicting Variable Names in Decompilation Output with Transfer Learning. In *Proceedings of IEEE Symposium on Security and Privacy (Oakland)*, 2024.

3. 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 USENIX Security Symposium*, 2023.

4. 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 ACM Conference on Computer and Communications Security (CCS)*, 2022.

Invited Talks and Presentations

- **Invited Talk**. Towards Human-Centric Decompilation. **NSA Research** 2024.
- **Invited Talk**. ARTIPHISHELL Intelligence: Advancing Autonomous Software Security with AI. **Oracle** 2024.
- **Keynote**. Your Teammate Isn't Human! Mixing Decompilation and AI for Modern Reverse Engineering. **HITCON**, Taiwan 2023.
- **Invited Talk**. Modern Approaches in Human-Centric Decompilation. **Ohio State University** 2023.
- **Invited Talk**. Bridging the gap in the static and dynamic analysis of binaries through decompiler tomfoolery. **CactusCon** 2023.

Scholarships and Awards

- National Science Foundation Graduate Research Fellowship, Honorable Mention 2022
- ASU Dean's Fellowship 2021
- Computing Research Association Undergrad Research Award, Honorable Mention 2021
- ASU Graduate Impact Award 2020
- ASU FURI Distinguished Researcher 2020
- Center for Cyber Safety and Education Scholarship 2020–2022
- APIA/Coca-Cola Foundation Scholarship 2019–2020
- Pauahi Mauo Scholarship 2018–2021
- Naho'okama Scholarship 2018–2020
- THINK STEM Scholarship Fund 2018–2020
- ASU New American Dean's Award 2017–2020

Vulnerability Discovery

- **pwn2own 2022: Synolgy NAS 0day**
  - To be publicized in March 2023
- **CVE-2019-10028: Netflix DIAL Server**
  - Publicized on Axios; Discovered at ForAllSecure
- **CVE-2019-13103, CVE-2019-13104, CVE-2019-13105, CVE-2019-13106: Das-Uboot**
  - Publicized on Threat Post; Discovered at ForAllSecure
  - RCE in largely used bootloader code

Open Source Contributions

- **Reverse Engineering Tools**
  - decomp2dbg: Static-to-dynamic analysis bridge, *600+ GitHub Stars*
  - DAILA: Improved decompilation using AI, *600+ GitHub Stars*
  - BinSync: Cross-decompiler collaboration tool, Funding: DARPA Award F8750-19-C-0003
  - angr (decompiler): Research decompiler, *7.1k GitHub Stars*

Extracurricular Activities

Shellphish CTF Team
Co-captain/Hacker 2018–Pres.

- Co-captain 2020-2023
- Maintained team's global ranking and U.S. ranking (3rd)
- Competed in over *124* 48-hour CTFs since 2018
- Organized two "iCTF" competitions, played by 200+ teams each year

ASU Hacking Club
Lecturer 2017–2021

- Taught program exploitation techniques; Lectured to 700+ students since joining
- Helped develop pwn.college, a free, online, learning platform for systems exploitation
- Created online ctf-based education resources used by thousands of students
- Hosted 2018 DEF CON Finals CTF with the Order of the Overflow