Zion Leonahenahe Basque

Ph.D. Computer Science Student

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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/Exploitation, Fuzzing, CFG Recovery, 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

- **Teaching Assistant** at ASU — Fall 2020
  Software Security (CSE545), Dr. Tiffany Bao
- **Challenge Writer** at ASU — Fall 2021
  Systems Security/pwn.college (CSE466), Dr. Yan Shoshitaishvili

PUBLICATIONS

1. 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

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

Projects

- **Open-source Reverse Engineering Tools**
    - angr: Symbolic Execution Engine, *5.6k GitHub Stars*
    - decomp2dbg: GDB-Decompiler Interaction Server, *376 GitHub Stars*
    - phuzzer: Fuzzing Management System, *158 GitHub Stars*
    - BinSync: Cross-Disassembler Collaboration Tool, Funding: DARPA Award F8750-19-C-0003

- **Academic Systems Security Research**
    - FlakJack: Finding Occluded Vulnerabilities with Exploit Patching and Fuzzing; Co-author; In-Submission
    - SAILR: Semantic Aware Intermediate Language Restructuring for Decompilation; Writing

Extracurricular Activities

Shellphish CTF Team
Co-captain   2018–Pres.

- Co-captain since 2020; Managed team of 20-40 hackers in competitions
- Organized weekly meetings; Maintained team's global ranking and U.S. ranking (3rd)
- Captained two DEF CON CTF Finals, competed in three total
- Competed in over *124* 48-hour CTFs since 2018; Specialized in Binary Exploitation
- Organized yearly team CTF "iCTF", played by 200+ teams each year

ASU Hacking Club

Lecturer

- 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