Zachary M. **Wimer**

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Objective

Secure systems through design/architecture review, fuzzing, static analysis, and tool development

Education

Arizona State University (ASU) — **GPA: 4.0**

Doctor of Philosophy: Computer Science (Incomplete) — *Aug. 2018 - May 2023*

Rensselaer Polytechnic Institute (RPI) (Summa Cum Laude) — **GPA: 4.0**

Master of Science: Computer Science
Bachelor of Science (Dual major) : Computer Science / Computational Mathematics
Minor: Economics — *Sept. 2014 - May 2018*

Experience

ASU & SEFCOM Lab	**Scientific Software Engineer (2 years), Research Assistant (2.5 years), & Graduate TA**, • Worked on angr, a powerful platform-agnostic binary analysis framework/symbolic execution engine geared towards vulnerability detection/exploitation. Used C++, Python, Z3, Azure • Participated in multiple DARPA hackathons towards building out tooling for cyber-atonomous reasoning systems aimed at both human-assistant and fully-automated vulnerability discovery, bug patching, and vunerability exploitation. • Researched AI / Machine Learning vunerabilities in both hardware and software, as well as timing-based side channel attacks • Security/AI/ML research paper **Subneural** publication pending peer review • TA'd for a senior level hacking course geared at binary exploitation • CTF'd with Shellpish and developed CTF tooling and infrastructure	*Aug. 2018-May 2023*
TGS	**Software Engineer**, CI / CD, Sys Admin, Docker, C++, Slurm	*Jan. 2019-Dec. 2020*
Easy Visa	**Software Engineer**, Security, Design, Development, Testing	*May 2017-Dec. 2020*
Private	**Tutor**, Calculus, Data structures, C++, Python, Chemistry, Physics	*Aug. 2013-May 2022*
Lutron	**Co-op**, Computer Science, developed internal tooling involving C++ and Python	*May 2017-July 2017*
RPI	**Undergraduate TA x3, RCOS Mentor**, Rensselaer Center for Open Source	*2015 & 2017*

Interesting Skills

- **Hacking** Specifically I am passionate about binary exploitation. I enjoy figuring out subtle or elegant ways to break things, especially when I use a system's own infrastructure to do so. I've also played in CTFs, including multiple **Defcon CTF**s since 2017 as part of **RPISEC** and **Shellphish**.
- **AI / Machine Learning Knowledge** My research was on AI / Machine Learning and cyber security.
- **Linux Internals** I use Linux (Fedora) daily as my desktop OS, NAS OS, and on multiple other systems
- **C++ Template Meta-Programming** I enjoy the ability to code in an amazingly versatile, super-fast, compile-time, pure functional sub-language within C++, which is my favorite language.
- **Computational Mathematics Implementations** I know how to implement mathematics on computers to avoid floating point errors and how to optimize many matrix operations / calculations for speed.
- **Tooling** Various Linux distros, Docker, LIBSVM, AWS, GCP, Azure, Slurm, PyPI, Jira, Code Wikis, libFuzzer, pwntools, Scapy, angr, gdb, IDEs, git, cmake, pytest, pre-commit, gpg, DynamoRIO, Github, etc.

Projects

C++, CMake	**SubNeural**, My research code: A program that can leak the internals of Neural Networks via repeatedly timing evaluations of the network. The paper is pending peer review.	*2018-2023*
Python, C++, Github, CMake, Z3	**angr, claripy, angr-management, & the angr organization**, • A core member of the angr team • Redesigned and rewrote much of claripy in C++ for vastly improved performance, true multi-threading, increased AST capacity, tighter Z3 integration, better memory management, and more • Coded, but also focused on triaging the backlog issues, internal organization, and pushed towards other code-quality enhancements (such as coding standards and pre-commit) • The driving force behind the giant refactors / code quality overhauls of a dozen angr and angr adjacent repos	*2019-2023*
Python, SQL, UML	**Shellphish Infrastructure**, A team lead on the Shellphish Infrastructure team; I designed and built an easy-to-use highly-configurable multi-modal CTF exploit-shooter and flag-submitter, designed with multiple redudencies to ensure minimal downtime, that uploads detailed reports and logs to a centralized database, game interface tooling, targeting modules, and more	*2022*
Host, Organizer	**WeCTFinASU**, I singlehandledly planned and organized a seminal workshop at ASU dedicated to sharing interesting presentations between top tier CTFers in 2019 called the Workshop To Explore Cyber Security in Academic Security Utility after securing a $50,000 budget to do so.	*2019*
C++,CMake	**DrShadowStack**, A software defined dynamically implemented shadow stack via DynamoRIO	*2018*