Alexander C. Sutila

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Summary

I am an ambitous Computer Systems Engineering and Computer Science student with a strong background in cybersecurity and low-level programming, currently working on my Master's Thesis and contributing to storage research. I am passionate about solving complex technical challenges and eager to apply my knowledge in real-world applications. I am seeking to leverage my skills in either an industry development or research role and I aspire to contribute to cutting-edge projects that involve system optimization, kernel-level development, and hardware integration.

Education

M.S, Computer Science (Cybersecurity) **Fall 2023 - Present**
- Arizona State University, Tempe, AZ 4.00 GPA
- Relevant Coursework: Real-Time Embedded Systems, Applied Cryptography, Software Security.

B.S.E, Computer Systems Engineering (Cybersecurity) **Fall 2019 - Spring 2023**
- Arizona State University, Tempe, AZ 4.00 GPA, Summa Cum Laude
- Relevant Coursework: Data Structures, Algorithms, Digital Hardware Design, Embedded Systems, Circuit Analysis, Operating Systems, Data Forensics, Networks and Security, Computer Architecture, Software Security.

Techincal Skills

Programming Languages: Proficient with Python, C, C++, Assembly; Experienced with Rust, Java, Nix.
Programming Libraries: Standard Template Library, Boost, Pydantic, Pandas, Numpy, Flask, FastAPI, Boto3, Pwntools.
Software Applications: LTSpice, Xilinx Vivado, Volatility, AccessData FTK Imager, IDA Interactive Disassembler, Valgrind, GDB and extensions.
Hardware Applications: Arduino/Raspberry-pi/KL46Z Microcontroller boards, Nexys A7 FPGA board.
Compilers and Utilities: GNU Compiler Collection, Cargo/Rustc, Git/GitHub, Jupyter, Docker.

Professional Experience

Virtualized Infrastructure, Systems, and Applications: Researcher June 2022 - Present
Optimizing the garbage collection performance/lifespan trade off in Zoned Namespace SSD-based caching strategies.
- The work of our team was submitted to multiple storage research conferences:
  1. **USENIX Conference on File and Storage Technologies (FAST '23)** : Accepted as a WIP
  2. **Massive Storage Systems and Technology Conference (MSST 2024)**: Accepted poster submission
- Gained experience with kernel debugging and Linux kernel module development using the device mapper framework.
- Implemented a host-side flash translation layer designed specifically to work with the constraints of the ZNS-SSD
- Developed a userspace simulator to replay real-world workloads and evaluate garbage collection efficiency.

Certifications

Microsoft Certified
- Azure Fundamentals (AZ-900) Earned on July 19, 2025
- Azure AI Fundamentals (AI-900) Earned on July 29, 2025

Academic/Personal Projects

Audio Recorder on FPGA Hardware **Academic Project**
- Designed audio serialization/deserialization modules using combinational and sequential logic.
- Integrated custom modules with IP memory to enable 2-second audio recording and playback.
- Supported multiple selectable memory blocks for audio storage.

Cloud Autoscaling & ML Pipelines **Academic Projects**
- Built scalable AWS-based systems using S3, SQS, EC2, and Lambda.
- Developed autoscaling infrastructure to manage EC2 instances based on workload demand.
- Created a serverless video facial recognition pipeline triggered via web uploads.

Embedded Systems Programming **Academic Projects**
- Programmed sensors and actuators (motors, displays, IMUs, encoders) in low-level C/C++.
- Developed navigation models on the Pololu 3pi+ for slopes and path following.
- Built an ARM-based tilt-controlled maze game using LCD and accelerometer input.

Game Console Emulators & Debug Tools **Personal Project**
- Built DMG-GameBoy and NES emulators from scratch in C/C++ with SDL2 and Win32.
- Emulated hardware behavior and quirks using public reverse engineering data.
- Added instruction tracing and memory tools; verified with open source test ROMs.

Other Work Experience

CSE330 - Operating Systems: Graduate Services Assistant Summer 2024 Semester

- Wrote required course project specification, expected implementation, grading rubrics, and grading scripts.

CSE340 - Principles of Programming Languages: Graduate Teaching Assistant Spring 2024 Semester

- Held office hours to assist student's with project implementation and completion of course assignments.
- Held in-person recitations consisting of working relevant problems live to review lecture material.

CSE330 - Operating Systems: Graduate Teaching Assistant Fall 2024 Semester

- Wrote required course project specification, expected implementation, grading rubrics, and grading scripts.
- Contributed to the development of an automated grading infrastructure built from scratch to assess kernelspace course projects and exams.

Activities

PWN.College - Capture the flag platform January 2022 - May 2024

- Participated in a publicly available capture the flag platform run by Arizona State University.
- Practiced a wide variety of software exploitation methods across both userspace and kernelspace.
- Practiced known stack and heap corruption methods, exploitation of race conditions, reverse engineering of x86_64 binaries, known micro-architectural exploits such as Meltdown and Spectre, and intercepting network communication.
- Earned physical blue and yellow belts as a reward for the full completion of the corresponding sets of challenges.

PicoCTF March 2023

- Participated in a publicly hosted Carnegie Mellon University (CMU) cybersecurity competition.
- Competed in a group of five Arizona State University students finishing in the top 1% of the global rankings.
- Practiced binary exploitation, cryptography, data forensics, reverse engineering, etc.