



# Alexander C. Sutula

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## Summary

I am an ambitious 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

<b>M.S, Computer Science (Cybersecurity)</b>	<b>Fall 2023 - Present</b>
<ul style="list-style-type: none"><li>Arizona State University, Tempe, AZ</li><li>Relevant Coursework: Real-Time Embedded Systems, Applied Cryptography, Software Security.</li></ul>	4.00 GPA
<b>B.S.E, Computer Systems Engineering (Cybersecurity)</b>	<b>Fall 2019 - Spring 2023</b>
<ul style="list-style-type: none"><li>Arizona State University, Tempe, AZ</li><li>Relevant Coursework: Data Structures, Algorithms, Digital Hardware Design, Embedded Systems, Circuit Analysis, Operating Systems, Data Forensics, Networks and Security, Computer Architecture, Software Security.</li></ul>	4.00 GPA, Summa Cum Laude

## Technical 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

<b>Virtualized Infrastructure, Systems, and Applications: Researcher</b>	<b>June 2022 - Present</b>
Optimizing the garbage collection performance/lifespan trade off in Zoned Namespace SSD-based caching strategies.	
<ul style="list-style-type: none"><li>The work of our team was submitted to multiple storage research conferences:<ol style="list-style-type: none"><li><b>USENIX Conference on File and Storage Technologies (FAST '23)</b> : Accepted as a WIP</li><li><b>Massive Storage Systems and Technology Conference (MSST 2024)</b>: Accepted poster submission</li></ol></li><li>Gained experience with kernel debugging and Linux kernel module development using the device mapper framework.</li><li>Implemented a host-side flash translation layer designed specifically to work with the constraints of the ZNS-SSD</li><li>Developed a userspace simulator to replay real-world workloads and evaluate garbage collection efficiency.</li></ul>	

## Certifications

<b>Microsoft Certified</b>	
<ul style="list-style-type: none"><li>Azure Fundamentals (AZ-900)</li><li>Azure AI Fundamentals (AI-900)</li></ul>	<div>Earned on July 19, 2025</div> <div>Earned on July 29, 2025</div>

## Academic/Personal Projects

<b>Audio Recorder on FPGA Hardware</b>	<b>Academic Project</b>
<ul style="list-style-type: none"><li>Designed audio serialization/deserialization modules using combinational and sequential logic.</li><li>Integrated custom modules with IP memory to enable 2-second audio recording and playback.</li><li>Supported multiple selectable memory blocks for audio storage.</li></ul>	
<b>Cloud Autoscaling &amp; ML Pipelines</b>	<b>Academic Projects</b>
<ul style="list-style-type: none"><li>Built scalable AWS-based systems using S3, SQS, EC2, and Lambda.</li><li>Developed autoscaling infrastructure to manage EC2 instances based on workload demand.</li><li>Created a serverless video facial recognition pipeline triggered via web uploads.</li></ul>	
<b>Embedded Systems Programming</b>	<b>Academic Projects</b>
<ul style="list-style-type: none"><li>Programmed sensors and actuators (motors, displays, IMUs, encoders) in low-level C/C++.</li><li>Developed navigation models on the Pololu 3pi+ for slopes and path following.</li><li>Built an ARM-based tilt-controlled maze game using LCD and accelerometer input.</li></ul>	
<b>Game Console Emulators &amp; Debug Tools</b>	<b>Personal Project</b>
<ul style="list-style-type: none"><li>Built DMG-GameBoy and NES emulators from scratch in C/C++ with SDL2 and Win32.</li><li>Emulated hardware behavior and quirks using public reverse engineering data.</li><li>Added instruction tracing and memory tools; verified with open source test ROMs.</li></ul>	

## Other Work Experience

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### **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

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### **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.