

## Summary

Cybersecurity professional with over 7 years of experience in research, development, and technical solutions for critical infrastructure security. Specialized in threat detection, vulnerability assessment, and system security, with proven success in delivering innovative solutions through R&D projects at Sandia National Laboratories. Experienced in optimizing digital experiences for businesses, leveraging AI and cloud-based technologies. Passionate about integrating cutting-edge security methodologies to drive efficiency and enhance cybersecurity defenses.

## Education

- MS** **New York University**, Computer Science 2020
- **GPA:** 3.9/4.0
  - **Notable Projects:** Developed TDFP, a taint-driven firmware fuzzer for embedded systems, presented in thesis work.
- BS** **University of Michigan**, Computer Science 2018
- **GPA:** 3.4/4.0

## Experience

- Sandia National Laboratories**, R&D S&E, Cybersecurity Livermore, CA  
June 2020 – Oct 2023
- Developed an ensemble fuzzing system by integrating 5-10 fuzzers, which led to a 30% faster threat detection and 40% improved response times in critical infrastructure.
  - Achieved 70-90% coverage on critical binary targets by optimizing AFL++ variants and applying custom mutation strategies, meeting stringent security and performance goals.
  - Reduced debug time by 30% by enforcing coding best practices (e.g., code reviews, CI/CD pipelines) and streamlining backlog refinement efforts using Agile methodologies.
- Sandia National Laboratories**, Critical Skills Recruiting Program Fellow Albuquerque, NM  
June 2018 – May 2020
- Created a robust framework in the ICS/SCADA modeling platform for Data Acquisition (DAQ) using Hardware-in-the-Loop (HITL), reducing data processing time by 20% and strengthening infrastructure security.
  - Conducted advanced research in cyber modeling and simulation using network topology analysis and vulnerability modeling, identifying critical risks in high-consequence networks and control systems.
- Sandia National Laboratories**, Intern, Cybersecurity R&D Albuquerque, NM  
May 2017 – May 2018
- Enhanced automated ELK dashboard deployment and monitoring within an ICS/SCADA platform by automating log ingestion, reducing detection time by 25% for cyber/physical infrastructure threats.
  - Implemented and configured honeypots in an experimental cyber range, simulating advanced persistent threats (APT) and identifying vulnerabilities in intrusion detection systems.
- University of Michigan**, Instructional Assistant Ann Arbor, MI  
Sept 2016 – Apr 2018
- **Courses:** Introduction to Computer Security (EECS 388), Programming and Introductory Data Structures (EECS 280)
  - Revamped Cybersecurity course content and hands-on projects by incorporating real-world threat scenarios and case studies, increasing student engagement by 15% and satisfaction by 20%.
  - Led weekly sessions for 25+ students, simplifying complex programming concepts and improving course pass rates by 10%.
  - Managed exam logistics for over 1,000 students, automating grading tools and coordinating exam locations, improving administrative efficiency by 25% and ensuring adherence to academic integrity.
  - Expanded Stanford's MOSS plagiarism detection system with custom Python scripts, increasing detection accuracy and identifying 5-7% of projects as potential academic misconduct violations.

- Delivered daily support by answering 10+ curriculum-related questions on Piazza, using tracking tools to ensure timely and accurate responses, contributing to a dynamic learning environment.
- Administered exams for 300+ students, streamlining exam writing, testing, and grading processes through automation tools, improving exam logistics efficiency by 20%.

#### University of Michigan, Grader

Ann Arbor, MI  
June 2003 – Aug 2003

- **Courses:** Programming and Introductory Data Structures (EECS 280)
- Graded weekly lab assignments for 100+ students, ensuring adherence to course standards and providing constructive feedback that improved coding accuracy and problem-solving skills.
- Provided detailed feedback on coding style, promoting best practices in code readability and efficiency, helping students improve their programming skills in data structures.

#### University of Michigan, Undergraduate Research Assistant

Ann Arbor, MI  
Jan 2016 – Dec 2016

- Conducted comprehensive literature reviews on data-driven methodologies, recommending key academic papers that directly supported the development of new research models and algorithms.
- Authored detailed summaries and data-driven analyses, providing insights that shaped ongoing research on algorithmic development and interdisciplinary problem-solving strategies.

#### University of Michigan, Computer Operator

Ann Arbor, MI  
Sept 2015 – Sept 2016

- Provided technical support for faculty, staff, and students, troubleshooting computer and AV equipment issues, reducing system downtime by 20% through efficient problem resolution.
- Managed help desk operations and ticketing system for troubleshooting, improving resolution times by 15% and ensuring seamless equipment setups for faculty and classroom needs.

## Publications

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### Taint-Driven Firmware Fuzzing of Embedded Systems

May 2020

*Melisa K. Savich*

Master's Thesis, New York University

### Taint-Driven Embedded Software Fuzzing

Mar 2019

*Melisa K. Savich*

RSAC Security Scholar Poster Board Exhibition

### CommPact: Evaluating the Feasibility of Autonomous Vehicle Contracts

Dec 2018

Jeremy Erickson, Shibo Chen, *Melisa K. Savich*, Shengtuo Hu, Z. Morley Mao  
[10.1109/VNC.2018.8628319](https://doi.org/10.1109/VNC.2018.8628319) (IEEE Vehicular Networking Conference (VNC))

### Artificial Network Traffic Generation

July 2017

*Melisa K. Savich*

Office of Scientific and Technical Information (OSTI)

## Projects

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### 48 Flavors Ice Cream, Technical Solutions & Digital Experience Architect

Westland, MI  
Nov 2023 – present

- Boosted food delivery platform orders by 55% in 1 year by redesigning the menus with AI-assisted item descriptions, improving SEO and user engagement, and enhancing e-commerce visuals using Canva.
- Optimized online presence by building and launching 2 websites using Google Sites and Square, managing the Google Business Profile, and integrating Google Analytics, Google Ads, Google Search Console, and 3 other Google products to increase online traffic by 25%.
- Streamlined the cake ordering system post-separation from Baskin-Robbins by configuring an automated 24-hour preparation time in the e-commerce platform, resulting in over 100 online orders in the first year and driving significant revenue growth.

## Skills

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**Programming & Scripting Languages:** Python, Java, C/C++, Bash, JavaScript, SQL, Assembly (ARM/x86), Go

**Cybersecurity Expertise:** Incident Response, Penetration Testing, Application Security, Malware Analysis, Reverse Engineering, Binary Analysis, Exploit Development, Network Security, Secure Coding Practices

**Vulnerability & Risk Management:** OpenVAS, Metasploit, Wireshark, NVD (CVE), OSV (Open Source Vulnerability)

**Testing & QA Techniques:** Black Box Testing, White Box Testing, Grey Box Testing, System Integration Testing, Regression Testing, Fuzz Testing, Unit Testing, Penetration Testing, API Testing

**CI/CD & DevOps Tools:** GitHub Actions, GitLab CI, Travis CI, Docker, Terraform, Ansible, Infrastructure as Code (IaC), Continuous Security Testing, Automated Defenses

**DevSecOps & Security Operations:** DevSecOps Practices, SIEM Integration, Vulnerability Scanning