Cameron Oakley

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Research Interests

My research interests focus on computer networks and cybersecurity, with a specific focus in engineering secure systems. During my undergraduate research, I worked on developing mitigation strategies for black hole attacks in Mobile Adhoc Networks (MANETs), specifically aiming to make the open-source BATMAN routing protocol more secure.

Education

CSU Monterey Bay, Marina CA — Aug 2022 - (Est.) May 2024
Bachelors of Science Computer Science, Networks and Security — GPA: 4.0/4.0

- Relevant coursework: Algorithm Design & Analysis, Data Science & Machine Learning, Computer Networks, Internet Programming, Software Design & Engineering.
- In-progress coursework: Capstone Project, Computer Science Service Learning, Database Systems, Network Administration, Network Security, Operating Systems.
- Proposed courses: Independent study for redesigning Computer Networks labs & projects.

Hartnell Community College, Salinas CA — Jul 2019 - May 2022
Associates of Science Computer Science — GPA: 3.937/4.0

- Relevant coursework: Calculus I & II, Data Structures & Algorithms, Discrete Structures, Foundational Programming, Object-Oriented Programming.

Research Experience

CSU Monterey Bay, Researcher — 2023 - Present
Mitigating Black Hole Attacks in MANETs, advised by Dr. Sam Ogden

- This research project focuses on exploring innovative mitigation strategies against black hole attacks within the MANET architecture, with a particular emphasis on mitigation strategies for the open-source BATMAN routing protocol.
- In this project, I achieved several milestones, including a thorough literature review where I learned of vulnerabilities of existing MANET architectures to black hole attacks. Additionally, I set up a build tool, OpenWRT, for compiling the BATMAN routing protocol source code in the Linux kernel and configured a development environment for the protocol.

Presentations

- "Exploring Mitigation Strategies for Common MANET Network Layer Attacks", *Monterey Bay Drone Automation and Robotics Technology Symposium* (Poster). — Oct 2023
- "Exploring Mitigation Strategies for Common MANET Network Layer Attacks", *CSU Monterey Bay UROC Summer Showcase* (Poster). — Aug 2023
- "Exploring Mitigation Strategies for Common MANET Network Layer Attacks", *CSU Monterey Bay UROC Spring Showcase* (Poster). — May 2023

Work Experience

Monterey County Sheriff's Office, Salinas CA — *Information Systems Unit*
Senior Departmental Information Systems Coordinator — Nov 2021 - Present

- Promoted to this position based on the work ethic demonstrated as a Student Intern. This role allowed me to work on higher-level tasks.
- Patched servers following vulnerability scans, which consisted of reading CVEs and documentation on applying patches.
- One project saw me determine optimal solutions to install a NTP server to keep the offline camera network synced. Another closely-related project saw me document all 250 cameras in the Corrections building along with their location, and determine how they communicate to the distribution rooms.
- Audited several security vulnerabilities within our organization. Found that an offline network had an internet connection which was a major security concern. Also, streamlined the process in which employees are given building access. Lastly, audited the process in which deputies extract and upload video evidence, which helped strengthen the reliability of court case evidence.

Student Intern May 2020 - Nov 2021

- This position helped to season my knowledge in computer science.
- As a student intern, I was fortunate enough to mentor two new IT staff members.
- Utilized my computer hardware knowledge to find performance bottlenecks in workstations throughout the department. This addressed issues with workstations having excessively long load times when opening forensic extractions.
- Became proficient troubleshooting Windows issues and reading through online documentation.

Temporary Employee Oct 2019 - May 2020

- Coming in with no computer science background, I started by helping IT staff with data entry.
- Assisted IT staff in recreating MCSO's website. Learned WordPress, HTML, CSS, and JavaScript. Also, FTP tools and Batch scripting.
- Shadowed IT staff and learned how to troubleshooting computers. Specifically, learned how to troubleshoot the jail management and report & warrant management software.

Monterey County Office of Emergency Services, Salinas CA *Documentation Branch*
Documentation Branch Leader Mar 2020 - June 2020

- In the early stages of the COVID-19 pandemic, I played a critical role at the OES helping coordinate volunteer efforts from the county's various departments.

Affiliations

UC Davis Envision Nov 2023

- Envision aims to remove obstacles hindering underrepresented students from entering and completing graduate school. The program consists of individuals with perspectives or experiences belonging to groups historically underrepresented in higher education.
- *Envision Team, Envision@ucdavis.edu*

Louis and Stokes Alliance for Minority Participation Jan 2023 - Sep 2023

- Initiative designed to provide assistance to underrepresented students and individuals encountering obstacles in achieving success in STEM fields.
- *Jessica Bautista, Campus Co-Coordinator for CSUMB-LSAMP, JBautista@csumb.edu*

California State University Monterey Bay UROC Researcher Jan 2023 - Sep. 2023

- UROC involves students from various majors in mentored undergraduate research, fostering educational ownership, intellectual vibrancy, and scholarly identity through rigorous scholarly activities.
- *Jessica Bautista, Research Associate for CSUMB UROC, JBautista@csumb.edu*

MESA (Mathematics, Engineering, Science Achievement) Nov 2021 - May 2022

- MESA is a club I was a member of when I attended Hartnell College. The club aims to provide academic development to educationally disadvantaged community college students so they can excel academically.

Leadership

Transfer Student Mentor for Otter Collective Aug 2023 - Present

- The Otter Collective program enhances the student experience by providing mentor experience. Student mentors are ready to listen, inspire, help navigate challenges, and recognize opportunities.
- My role as a Student Mentor involved mentoring five transfer and first year computer science students.

Vice President of the Network Security Team Sep 2022 - Present

- Student-led club at CSU Monterey Bay where we participate in hackathons. As a seasoned competitor, I helped teach the new club members the basics of penetration testing or explained conceptual topics.
- My role is Vice President was administrative, I reached out to companies to acquire software licenses for club use.
- Before serving as Vice President, I was the club's ICC Representative. In this role, I presented budget proposals to allocate funds to our club to financially support club events.

Awards & Honors

Codepath Cybersecurity Course Completer Aug 2023 - Dec 2023

- Learned tools and methodologies used by blue team security analysts, applying industry-proven techniques for detecting, analyzing, and responding to security threats.

Dean's List at Hartnell College & CSU Monterey Bay 2019 - Present

Graduated Summa Cum Laude from Hartnell Community College May 2022

Projects

Home Networking Lab Jun 2023 - Present

- Actively building a home networking lab, utilizing various Cisco networking hardware to build a private network for hands-on experience in network design.

Reverse Engineering Malware Nov 2023 - Present

- Actively learning the principles to reverse engineer malware. This includes learning methodologies for both static and dynamic analysis, and establishing a secure environment for executing malware.

Dedicated Gaming Server Nov 2023

- Setup a dedicated server for hosting multiplayer games, expanding my Linux and CLI proficiency. Through this project, I developed skills in configuring firewall rules with UFW and creating and managing systemctl services.

Home RDP Server Oct 2023

- Setup my PC at home to allow RDP connections from the internet. I added in some additional security to block brute-force login attempts. The most challenging part of this project was setting up port forwarding.

Windows Keylogger Oct 2023

- This was created as part of a class assignment. I developed a Windows keylogger that set a system hook and intercepted all keyboard traffic bound for the OS.
- Please email me for a link to the GitHub repository.

Hackathons

National Cyber League & CyberSEED Nov 2022, Feb 2023, & Apr 2023

- Participated in both individual and team competitions, completing cybersecurity challenges that involved Incident Response, exploiting vulnerable programs, analyzing packet captures using Wireshark, examining log files with grep and awk utilities, reverse engineering programs and binaries with Ghidra disassembler and GDP debugger.

UC Santa Cruz ForAllSecure Apr 2023

- Developed skills in securing open source software through the application of fuzzing techniques for identifying and addressing software vulnerabilities.
- Additionally, developed skills in fundamental DevSecOps principles, Docker and Github Actions, and using Mayhem for testing applications to find defects.

Earthquake Data, Web Interface March 2023

- Using Node.js, I developed an Express app using the Model View Controller (MVC) design pattern. This app accepts multiple routes and receives parameters from various HTML form elements.
- The controller queries an Earthquake API using node-fetch and information is then processed by the view engine and sent to the browser.
- Used the Embedded JavaScript templating engine for processing views, Node packages for log messages, and HTTP error messages. For formatting the HTML pages, I used Bootstrap and other CSS properties.
- GitHub: https://github.com/camsterrrr/EarthquakeApp

Gradebook Application, Full-Stack Development Jan 2023 - May 2023

- Using MySQL, I designed a relational database that includes entities for courses, enrollments, and assignments.
- Using the SpringBoot server framework, I developed a back-end RESTful API that uses Java CRUD repositories to manage database records and accepts multiple routes. I used RabbitMQ for service-to-service communications and JUnit, PostMan, and Selenium for testing.
- Used Node.js and React to create a front-end web app that queries the backend and displays the results using HTML, CSS, and JS.
- GitHub (Frontend): https://github.com/c-oakley/CST438-Gradebook-frontend-COakley
- GitHub (Backend): https://github.com/c-oakley/CST438-Gradebook-backend-COakley

Technical Skills

- Frameworks: Node.js, React, Spring Boot
- Programming languages: C, C++, Java, JavaScript, Python
- Other languages: HTML, LaTeX, Markdown, SQL
- Network Emulators: Mininet/Mininet-Wifi Network Simulators, OpenWrt
- General Tools: FileZilla & WinSCP, Git & GitHub, Google Colab, Splunk, VirtualBox
- Security Tools: Burp, Catalyst, Kali Linux, NMAP, MISP, Wazuh, Snort, Splunk, Wireshark