ELLIOT GRANT SHABRAM

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EDUCATION

Master of Science in Computer Science — *Davis, CA*
University of California, Davis — *In Progress*

Bachelor of Science in Computer Science - Concentration in Networks and Security — *Seaside, CA*
California State University, Monterey Bay (CSUMB) — *May 2024*
GPA: 3.97

General Education Certification, — *Monterey, CA*
Monterey Peninsula College — GPA: 3.696

RESEARCH INTERESTS

My research interests include radio technologies, networks and security, privacy, distributed systems, data compression, and topics in machine learning. I am particularly interested in wireless communication with IoT devices. My work has primarily centered around mobile ad-hoc networks (MANETs) and ABAC policy attribute prediction. I have also extensively researched data compression, designing a custom stream compression algorithm for real-time messaging targeting short text messaging.

RESEARCH EXPERIENCE

Undergraduate Researcher, PI: Dr. Cao Thang Bui — *Seaside, CA*
California State University, Monterey Bay (CSUMB) — *Spring 2024 - Current*

- *Project Description:* ABAC Policy Attribute Prediction
  Studied Attribute Based Access Control (ABAC) Policies, specifically for predicting attributes using a novel machine learning technique that we call *Group Analysis*.
  - *Relevant Skills:*
    - Python data science tools: NumPy, Pandas, Scikitlearn, Seaborn, Matplotlib.
    - Machine learning techniques and feature selection.
    - LaTex document preparation.

Undergraduate Researcher, PI: Dr. Samuel Ogden — *Seaside, CA*
California State University, Monterey Bay (CSUMB) — *Fall 2022 - Spring 2024*

- *Project Description:* Compression Algorithm
  Designed a new streaming compression algorithm for ASCII text that uses shared headers to achieve significant compression in messages as small as two characters in length. I also implemented a version of Huffman Coding, which I integrated into the algorithm for larger file compression.
  - *Relevant Skills*:
    - Advanced Python programming.
    - Understanding of compression algorithms such as Huffman, Zstandard, and DEFLATE.
    - Python data science tools.
    - LaTex document preparation.
- *Project Description:* MANETs
  Exploring packet loss and reliability in mobile ad hoc networks (MANET).
  - *Relevant Skills*:
    - Socket programming in the Python language.
    - Intimate knowledge of the Mininet-Wifi network simulator.
    - Network tools such as Wireshark and Nmap
    - Understanding of protocols and network layers.
    - Python data science tools.

PRESENTATIONS

"SafePi - A Secure Home Security IoT Device" (Winner of CS Faculty Choice Award) *Seaside, CA*
CSU Monterey Bay Computer Science Capstone Festival *Spring 2024*
Shabram, E. G., Carey, J., Diaz-Wahl, T., Cristecu, L.

"Analyzing Reliability in Mobile Adhoc Networks" *Seaside, CA*
The 2023 Monterey Bay Drone Automation and Robotics Technology (DART) Symposium *Oct 2023*
Shabram, E. G., Ogden, S. S.

"Mobile Adhoc Networks Revisited" *Seaside, CA*
CSUMB Summer Research Symposium *Aug 2023*
Shabram, E. G., Ogden, S. S.

WORK EXPERIENCE

Software Engineer *May 2023 - Current*
Lansmont Corporation *Monterey, CA*

- Worked with embedded Yocto Linux systems, FreeRTOS, and Xilinx tools.
- Coded in various programming languages, including C, C++, C#, Python, TCL, Awk, Sed, and Bash.
- Automated the build system via Python, TCL, and Bash scripting.
- Configured U-boot boot system for production boot.
- Contributed to the vibration controller design.
- Programmed and used FPGAs.
- Used and maintained Azure DevOps and Git repositories with the use of work items, tasks, issues, and pull requests.

Teaching Assistant for CST 311 - Intro to Networks *Aug 2023 - May 2024*
California State University, Monterey Bay (CSUMB) *Seaside, CA*

- Helped to build new labs and assignments for the new head of the networks and security concentration curriculum at CSUMB.
- Held weekly office hours to answer questions and work through issues with students.
- Graded programming assignments.
- Held regular meetings with the professor to plan out project and lab implementation.
- Attended in-class labs.

Data Analyst *Sept 2023 - Oct 2023*
Community Builder For Monterey County (NGO) *Monterey, CA*

- Compiled and analyzed data to help assess the organization's impact.
- Sought key points of interest for grant proposals.
- Managed website analytics.
- Wrote scripts to query APIs and visualize data.

TASC CS and Mathematics Tutor *Aug 2023 - Dec 2023*
Monterey Peninsula College *Monterey, CA*

- Helped cultivate a new tutoring program at Seaside High School
- Assisted students in their learning goals with pre-calculus, python programming and various other subjects.
- Logged interactions with students.

Trio SSS Mathematics Tutor *July 2022 - June 2024*
Trio Learning Center at Monterey Peninsula College *Monterey, CA*

- Assisted students in mathematics, from introductory college algebra, through advanced vector calculus.
- Lead groups, workshops, and team-building exercises, as well as several public speaking opportunities.
- Assisted with contacting students for lending library supply checkouts.
- Assisted in event setup and take-downs.

LICENSES AND CERTIFICATIONS

FCC Amateur Radio License, Technician Class *Issued: Jan 2023*
Call Sign: KN6YCI *Expires: Jan 2033*

Link: https://drive.google.com/file/d/11xBn4Ycd_kZGAxlEaILOrOvj1U0y1B8S/view?usp=sharing

CodePath Cybersecurity Course, Certificate of Achievement - Honors *Fall 2023*
Presented by CodePath at California State University - Monterey Bay in recognition of outstanding performance during the successful completion of the Intermediate Cybersecurity Course CYB102.
Certificate ID: 189103
Link: https://drive.google.com/file/d/1dkNFT888pG981dJePCVtZesooQHnVXBC/view?usp=sharing

HONORS AND AWARDS

CS Faculty Choice Award For Senior Capstone Project *Spring 2024*
California State University, Monterey Bay (CSUMB)

Magna Cum Laude *Spring 2024*
California State University, Monterey Bay (CSUMB)

- Distinction given to students upon graduating with a cumulative GPA between 3.7 and 3.9.

Apple Scholar *Spring 2023 - Winter 2023*
California State University, Monterey Bay (CSUMB)

- Awarded to ten students in the whole of the CSUMB population.
- Prioritizes Hispanic/Latinex Students
- Access to state-of-the-art Apple products
- $2000 per semester

Louis Stokes Alliance for Minority Participation (LSAMP) Scholar *Fall 2022 - Spring 2024*
California State University, Monterey Bay (CSUMB)

- Provides graduate school prep, fee waivers for graduate program applications, and various other STEM related opportunities.
- $1500 per semester

Congressional Recognition by United States Congressman, Jimmy Panetta *Spring 2022*
Monterey Peninsula College (MPC)

- Recognition of outstanding and invaluable service to the community upon graduation from the Trio SSS program for first-generation and low-income students.

Dean's Highest Honors *Spring 2022*
Monterey Peninsula College (MPC)

- Designation given to those receiving a semester 4.0 within 2 years of graduation.

Dean's Honors *Spring 2022*
Monterey Peninsula College (MPC)

- Recognition for outstanding performance and dedication to the highest standards of academic excellence.

LEADERSHIP

First Year and Transfer Student Mentor *Summer 2023 - Spring 2024*
California State University, Monterey Bay Mentor Collective *Monterey, CA*

- Mentored four transfer and first-year students.
- Met at least once a month to check in with students and provide support.
- Helped guide students to a positive and successful experience at CSUMB.

Peer Mentor - Summer Bridge Program Prep *Summer 2023*
Trio SSS program at Monterey Peninsula College (MPC) *Monterey, CA*

- Helped lead nearly 80 students in a two-day program for incoming Trio students.
- Lead students in team building exercises, group games, bonding experiences, and public speaking.
- Facilitated students in creating and performing a group chant and poster.

Virtual Cyber Security Escape Room *Fall 2022*
Trio SSS program at Monterey Peninsula College (MPC) *Virtual*

- Gave an introductory presentation on cyber security.
- Guided students through puzzle solving.
- Used Caesar and book ciphers to scramble clues.

Peer Mentor - Summer Bridge Program Prep *Summer 2022*
Trio SSS program at Monterey Peninsula College (MPC) *Monterey, CA*

- Led over 70 students on a two-day learning and bonding event.
- Mentored smaller groups in team-building exercises, such as creating and performing a group chant and group poster.
- Lead full group in games.
- Spoke on my experiences through college and life.

INVITED SPEAKING ENGAGEMENTS

Trio SSS Student Panel: How to study for finals. *Spring 2023*
Trio SSS program at Monterey Peninsula College (MPC) *Monterey, CA*

- Answered students' questions on how to develop good study habits, deal with stress, and prepare for finals.
- Spoke on my personal experience through college life.

Speech on My Success Story *Spring 2023*
Trio SSS Silent auction, Monterey Peninsula College *Monterey, CA*

- Spoke on my experience through the Trio program and how it aided me in my academic journey.
- Spoke on my life experience, from working in construction to deciding to return to college.
- Spoke on the personal challenges to my education, such as having two children during my undergraduate career.

PROJECTS

SafePi: A Secure Headless IoT Device *Winner of CS Faculty Choice Award

- **Description:** This project consists of three major parts: an embedded Linux IoT device (RPi 4) that utilizes Bluetooth Low Energy (BLE) communication for provisioning, an Android application for user interaction and authenticating the IoT device, and an online server and database for storing user credentials, granting and authenticating OAuth2 tokens, and storing and reporting status information to and from the IoT device and Android App.
- **Skills:** Python, Kotlin Android app building, NodeJS backend, NGINX configuration, Linux OS
- **Role:** Configured and wrote all code for the embedded device and BLE communication. Wrote the majority of the Android application. Set up and configured AWS EC2 instance with NGINX reverse proxy, Let's Encrypt certificate for HTTPS, and initialized the NodeJS app. Configured the encryption scheme between all devices. Managed the Github organization and repositories. Wrote most of the documentation. Performed the live demonstrations.
- **Additional Features:**
  - Android BLE Scanner and connector (any device)
  - Android BLE packet sniffer
  - Python BLE client with CLI for interaction and remote command
- **Github Organization:** `https://github.com/Not-Cameron-Inc`

SMC Stream Compression Algorithm

- **Description:** Developed a stream compression algorithm in Python targeted at SMS character limits. Utilizes shared headers and a custom encoding scheme for efficient compression at the binary level.
- **Achievements:** Achieved a near 50% compression ratio for messages down to two ASCII characters.
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/SMC_Compression.git`

Spaceisdirty.com

- **Description:** Designed and developed a website for my recording group, including server management and NGINX configuration. The website is hosted on my home server, utilizing port forwarding and a reverse proxy.
- **Skills:** NGINX, Let's Encrypt, Gunicorn, Flask, HTML, CSS, JavaScript.
- **Role:** Sole developer.

- **URL:** `www.spaceisdirty.com`

Reference Monitor

- **Description:** Python-based reference monitor implementing an access control matrix for granting/checking privileges. Includes an options menu and visualizations in both matrix and linked-list form.
- **Skills:** Python, ACM, authentication schemes.
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/Reference_Monitor.git`

CaesarCipher Autodetection GUI Desktop Application

- **Description:** Developed a GUI application for encryption/decryption with auto-detection using Qt via PySide6. This project was selected from the CST412 Network Administration course at CSUMB and was presented to jr. high/high school students visiting Hartnell College to showcase the possibilities of coding, particularly student-made creations.
- **Skills:** Python, PySide6, QT GUI development.
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/CaesarCipher-Autodetection-GUI.git`

Website Status Checker

- **Description:** A Windows-based Python program that checks if my website is alive and sends me a toast notification if it is not.
- **Skills:** Python, Windows background tasks, Powershell scripting
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/Webpage-Status-Checker.git`

Egg-Shell (EGSH)

- **Description:** Developed a simple command-line interface (CLI) in C, implementing Linux commands, re-implementing bash commands, and custom commands. The CLI serves as a foundation for future projects that require a customized shell with additional functionality. This project began as part of an assignment for CST334 Operating Systems at CSUMB but has since been extended to add more features.
- **Skills:** C programming, GCC, GDB, Linux OS, multi-threaded programming
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/EGSH.git`

Simple Blockchain

- **Description:** Created a basic blockchain implementation to showcase my grasp of fundamental blockchain concepts for my CST412 Network Administration course at CSUMB.
- **Skills:** Java, hashing algorithms, proof-of-work, blockchain verification.
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/Simple_Blockchain.git`

P2P Chat

- **Description:** Created a versatile command-line peer-to-peer chat script that functions as both a client and a server. The script facilitates bidirectional communication between peers.
- **Skills:** Python, socket programming, multi-threaded programming,
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/P2P_Chat.git`

vHarmony - Vehicular Match Making Website

- **Description:** A website designed to match users with a vehicle by analyzing user preference. I designed the majority of the website. This project was presented to the CST205 Multimedia Programming and Design course at CSUMB.
- **Skills:** Python, Flask, Bootstrap, WTForms, API requests, HTML, CSS.
- **Role:** Project Manager.
- **GitHub:** `https://github.com/eshabram/vHarmony.git`

VG_Sales Data Science Report

- **Description:** A data science report on the *Video Game Sales* dataset obtained through Kaggle. We used logistic regression to predict whether new video games by Nintendo had the potential for success.
- **Skills:** Python, Scikit-learn, Numpy, Pandas, Matplotlib, Scipy, Seaborn, ML algorithms

- **Role** Project Lead.
- **GitHub:** `https://github.com/eshabram/VG_Sales_Report.git`

Otter Library Android App

- **Description:** Created a book checkout Android application using Java and SQLite. The application incorporates user authentication, and book search by title and author, and employs databases for persistent book and user tracking. This project was completed as part of CST 338 Software Design at CSUMB.
- **Skills:** Java, Android Studio, SQLite
- **Role:** Sole developer.
- **GitHub:** `https://github.com/eshabram/OtterLib.git`

SKILLS

- Coding in Java, Python, C, C++, C#, JavaScript, Kotlin
- Scripting languages: Bash, Awk, Make, Sed, TCL
- GNU/Linux extensive knowledge
- Embedded systems: U-boot, Yocto Linux, Xilinx tools
- Security Tools: Burp, Splunk, Wireshark, Nmap, MISP, Wazuh, Snort, Catalyst, Kali Linux
- Data Science Tools in Python: NumPy, Pandas, Scikitlearn, Seaborn, Matplotlib
- Android Development in Android Studio (Java and Kotlin)
- Visual Studio application building in WPF
- Socket Programming in Python
- Web building: HTML, CSS, JS, Flask, NodeJS, Express, EJS
- Web hosting: AWS, Azure
- NGINX: Configuring and managing securely.
- Mininet/Mininet-Wifi Network Simulators
- Bluetooth Low Energy Development in Python/Kotlin
- Docker
- Virtual Machines: VirtualBox, VMware, QEMU, UTM
- SQLite, MySQL