Mattias Duffy

Fort Lauderdale, FL • mattiasd73@gmail.com • linkedin.com/in/md-security • mattias-devs.xyz

German and US Citizenship

WORK EXPERIENCE

Ironrange Cyber (Startup)   **12/2021 - Present**
Cybersecurity/Fullstack Engineer

- Boosted the performance of our high-throughput vulnerability scanner by ~300% through parallelization, resolving critical bugs and enhancing efficiency, resulting in a significant reduction in security risks for the business.
- Utilized open-source security tools, including OWASP ZAP, AMASS, NMAP, and proprietary solutions, to identify vulnerabilities in client's external and internal networks via deployed agents.
- Collaborated with customers to identify use cases and redesigned the frontend UI using a React-Redux and FastAPI stack, improving the product's user experience and functionality.
- Refined the previous design by integrating observability and testing with tools such as Grafana, Prometheus, and OpenTelemetry effectively addressing distributed errors and employing frameworks that expedited feature development.

Leidos   **03/2021 - 06/2021**
Offensive Cyber Operations Software Engineer

- Identified ROP gadgets and functions through Ghidra firmware analysis, enabling successful Remote Code Execution (RCE) attacks, enhancing offensive cyber capabilities.
- Enhanced firmware analysis and fuzzing processes using Binwalk, Qiling, and QEMU.
- Developed UART interface scripts and custom MIPS shellcode, showcasing RCE capabilities for exploit testing.
- Conducted comprehensive exploit research, presenting findings and vulnerabilities to clients.

George Mason University   **01/2018 - 01/2021**
Cyber Forensics Researcher

- Hacked boot-loaders and recovered firmware from embedded devices, integrating pen-testing and hardware debugging techniques.
- Reverse Engineered a decompression algorithm for undocumented firmware for further analysis.
- Created a specialized Network Asset Detection tool for Navy ships to strengthen maritime cyber defenses.

Fluency Security (Startup)   **05/2016 - 09/2017**
Information Security Intern

- Wrote infrastructure management tool in Golang that automatically deploys and monitors instances of fluency software in AWS.

- Tuned hardware and software to handle larger bandwidth clients.
- Wrote changes to the flow engine that improved speed by 57% by using different drivers.
- Wrote a display driver for hardware to be installed in client facilities.

EDUCATION

Bachelor of Science in Cybersecurity Engineering

George Mason University • VA   08/2015 - 12/2020

Cofounder: GMU Satellite Communications Club 08/2018 - 12/2020
Project Manager: Mason Student Run Computing Technology 12/2016 - 12/2020

AWARDS & SCHOLARSHIPS

IoT Security Challenge 1st Place   11/2019

Patriot Hacks

Society of Satellite Professionals International Mid – Atlantic Regional Chapter Scholarship

SSPI

PROJECTS

GMU Sat-Com Wi-Fi Decoding and Direction of Arrival (DOA)   11/2019 - 02/2021

- Implemented Wifi 802.11n PHY layer in GNURadio, creating transceiver flow graphs and stages for compression, error-correction, and encoding algorithms
- Leveraged SDRs for signal processing array, using algorithms like Bartlett, MUSIC, MVDR for Direction of Arrival (DOA) of wifi signals.

Wi-Fi Implementation in GNURadio from scratch   01/2020 - 02/2021

- Created a Wi-Fi transceiver in GNURadio using the original 802.11n Wi-Fi standard.
- Implemented python blocks for preambles, modulation, coding, scrambling and interleaving in GNURadio
- Documented each step of the process to teach other members in the club about OFDM, coding and recovery algorithm concepts

Connection Resilient Bodycam with Built-In Non-Repudiation and Verification Features   09/2019 - 12/2020

Hexagon Federal

- Completed senior capstone project working on a team with Hexagon Federal to create a body-cam that has anti-tampering and non-repudiation features.
- Worked with Hexagon Federal revising their RFP, created a project timeline, provided deliverables at each stage
- Created a research paper and presented project in-front of a panel of judges
- Developed a mobile app capturing video, created encrypted metadata at recording time, used to prevent tampering and create a chain of non-repudiation.

- Utilized P2P network library to sync metadata with other body-cams, so metadata chain is preserved on multiple devices in the case of unreliable network connectivity.

What's Open web v2   01/2018 - 05/2019
- Rewrote existing HTML/CSS project in React and Redux, adding new responsive features ground up with security in mind
- Worked with GMU administration to get the project forked by the university and used as an official website

CERTIFICATIONS

Deploying Machine Learning Models in Production

DeepLearning.AI

Machine Learning Engineering for Production (MLOps) Specialization

DeepLearning.AI

Machine Learning Modeling Pipelines in Production

DeepLearning.AI

Machine Learning Data Lifecycle in Production

DeepLearning.AI

Generative AI with Large Language Models

DeepLearning.AI

Machine Learning in Production

DeepLearning.AI

SKILLS

Technologies & Tools: Tailwind, SQL, Redux, Vercel, NextJS, NMAP, Prometheus, OpenTelemetry, React-Redux, Grafana, PostgeSQL, AMASS, OWASP ZAP, FASTAPI, Docker, GNU Radio, Ghidra, Rizin, Radare2

Programming Languages: C, C++, Golang, HTML, CSS, Javascript, React, Python

Expertise: Satellite Communications, Reverse Engineering, Pen-testing, Open-source Security Tools, Offensive Cyber Operations, Network Detection, IoT Security, Information Security, Fullstack Engineering, Firmware Analysis, Exploit Testing, Cybersecurity Engineering, Cyber Forensics, Signal Processing