Matthew Lazarowitz

Senior Software Engineer
LinkedIn | GitHub

Work Experience

NVIDIA — Sr Software Engineer

Santa Clara, USA | Jul 2017 – Present

- **Owned the NvSIPL Core Verification project**, tracking unit and integration test metrics, resolving or coordinating fixes for failures, and supplying verification data to support **ISO 26262** compliance
- Established a framework for the **physical safety of active sensors** on the DRIVE IX platform, aligning with automotive safety and compliance requirements
- Formulated C and C++ coding guidelines in alignment with **MISRA** and **AutoSAR** standards, guiding adoption across teams
- Integrated industry-standard practices into the **formal code inspection process**, including a metrics-driven strategy for planning, execution, and continuous improvement
- Pioneered use of **AI-assisted development tools (Cursor)** to analyze complex C++ code paths, creating structured context for LLMs that enabled automated test-to-function traceability and improved debugging efficiency

Automation and Tooling Contributions

- Developed an **automated C++ code analysis pipeline** (Clang Diagnostic Parser) to identify non-C++98 compliant patterns across large codebases, enabling systematic modernization of legacy systems
- Created a **metrics collection and reporting system** to track code quality and support data-driven development decisions
- Engineered **Python automation systems** for Perforce integration, reducing manual compliance effort by **90%** by generating and maintaining work product index files for 47+ artifacts
- Automated **hardware testing workflows** (Drive Farm Colossus helper scripts) through shell scripting, reducing manual setup time and configuration errors
- Built **Perforce integration tools** to catalog and extract metadata from engineering work products, establishing the foundation for document management automation workflows
- Developed a **report aggregation system** to automatically download and organize test results, coverage data, and analysis reports from multiple testing platforms into structured P4 workspaces
- Prototyped a tool to **extract and analyze metrics** from static and dynamic testing reports (SWUTR reports), streamlining software test result reporting

Cisco Systems — Technical Lead

San Jose, USA | Jun 2012 – May 2017

- **Led the design and implementation** of the Precision Boot Order feature for Cisco blade servers, enabling fine-grained control of boot sequencing across complex environments
- Authored and submitted **multiple patent applications** related to server firmware innovations
- Enhanced firmware logging systems, accelerating root cause analysis of unexpected boot behaviors and improving system reliability
- Developed **UEFI shell utilities** that streamlined BDS issue troubleshooting for engineering teams
- Prototyped an XML parser to optimize communication between UCSM and server firmware, reducing interface overhead
- Conducted early research on **unit testing for UEFI firmware**, implementing a hybrid unit testing framework ahead of Microsoft's official tooling
- Ensured **on-time hardware launches** by resolving compatibility issues and establishing cross-team firmware standards

Booz Allen Hamilton — Senior Software Engineer

McLean, USA | Oct 2010 – May 2012

- Engineered and enhanced **mobile data recovery tooling** for a DOJ client, improving forensic analysis capabilities for law enforcement
- Performed **vulnerability assessments** on feature phones, identifying and mitigating potential security risks
- Conducted in-depth analysis of **feature phone flash images**, supporting recovery of critical digital evidence

American Megatrends — Software Engineer

Norcross, USA | Sep 2005 – Sep 2010

- Developed and maintained **firmware for new hardware platforms**, contributing to successful product launches across multiple OEM partners
- Implemented **custom firmware features** in response to client requests, strengthening AMI's reputation for customer-focused solutions
- Migrated features across code bases to ensure backward compatibility and consistent functionality across product lines
- Performed **root cause analysis** of software failures, reducing defect recurrence and improving firmware stability

Projects

ESP8266 IoT Framework

- Developed a configurable **IoT framework** for ESP8266 microcontrollers (Arduino) featuring runtime configuration through a responsive web interface, eliminating the need for reflashing firmware
- Implemented **persistent JSON-based configuration storage** with LittleFS and multi-mode Wi-Fi operation (AP/Station) with intelligent reset detection for mode switching
- Engineered **power-efficient design** with Wi-Fi state management and deep sleep modes, extending device battery life
- Designed framework for **security and flexibility**, supporting multiple ESP8266 board variants

ESP8266 Environmental Monitoring System (SHT30)

- Built a **low-power IoT temperature and humidity monitor** integrating an SHT30 sensor with an ESP8266 microcontroller
- Implemented **MQTT communication** for real-time reporting to central monitoring systems with secure authentication
- Engineered **fault-tolerant design** with error checking, timeout handling, and infrastructure issue detection
- Leveraged custom IoT framework for **runtime configuration and reliable field operation**

Game Data Analysis Tool (No Man's Sky Save Parser)

- Developed a **Python tool** to parse and analyze binary save data from *No Man's Sky*
- Implemented **3D coordinate transformation algorithms** converting in-game positions into geographic latitude/longitude
- Created **CSV export pipeline** for systematic analysis of player bases and discovered systems
- Built a **CLI tool with argparse**, supporting flexible data output and integration into larger workflows

IR Protocol Reverse Engineering (Vornado Fan)

- Reverse engineered a **proprietary IR protocol** for the Vornado Transom fan through signal capture and analysis
- Implemented an **ESP8266-based IR remote system** using precise PWM modulation and microsecond-level timing control
- Designed a **robust command encoding/validation system** supporting multiple modes (power, speed, direction)
- Integrated with **home automation platforms via MQTT**, enabling remote smart control of the fan

Motion (forked open-source project)

- **Diagnosed and corrected NVENC hardware-accelerated video encoding issues** in Motion, restoring stable and high-quality video performance

Education

Penn State University — B.S. Electrical Engineering
Dec 2004 | *USA*

Publications

- *Edge Anti-Aliasing Utilizing Morphological…*
  Proc. of the International Conference on Consumer Electronics (2005)
  — Proposed novel image processing kernels for edge detection and anti-aliasing

Patents

- **US8869282** — Anti-malware support for firmware
- **US9401848** — Stateless flexible boot control

Skills

- **Languages:** C, C++, Python
- **Domains:** Firmware, Embedded Systems, Automotive Safety, IoT, System Software
- **Practices:** Code Coverage, FMEA, Code Inspection, Static/Dynamic Analysis, Safety Standards (MISRA, AutoSAR, ISO 26262), AI-Assisted Development
- **Tools:** Perforce, Git, UEFI, MQTT, LittleFS, Arduino, ESP8266, FFmpeg/NVENC, Cursor (AI code assistant)

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