MARIS USIS

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Firmware and systems engineer building solid-state power infrastructure in C and Rust. In my spare time, working on a low-latency remote desktop solution built on QUIC and Linux.

EXPERIENCE

Firmware + Systems Engineer
2025–present

Vertiv
Delaware, OH

- Developing firmware for solid-state switchgear in C; software-in-the-loop tests in MATLAB.
- Reverse-engineered C2000 debugger protocol to automate manual test sequences previously run by hand, saved hours when long tests need to be re-ran.
- Built a crude sampling profiler for C2000 in Rust; wrote up an internal document describing the statistics.
- Built an AI-first product knowledgebase (async Rust, Qdrant, PostgreSQL, object storage) indexing project management, source code, and docs. Designed to be highly incremental–hours for initial scrape vs minutes for an update–yet generic over source-specific backends (e.g. Rally, git, documentation). Over 50k artifacts indexed.

Research Aide
2024–2026

Argonne National Laboratory
Remote

- Analyzing price uncertainty in electricity market predictions from ARGUS to lower costs for the Western Area Power Administration.
- Using complex `polars` expressions to corral river flow and temperature data from different sources across a 40 year period.

Reverse Software & Hardware Engineer Intern
May 2023–August 2023

Caesar Creek Software
Dayton, OH

- Vulnerability research on Garmin Instinct 2 smartwatch ARM firmware using Ghidra, GDB, and OpenOCD hardware debugging
- Built internal tools to aid in reverse engineering using Rust and C++

Product Development Intern
May 2022–August 2022

MRI Software
Solon, OH

- Built an automated testing suite for the Public and Affordable Housing software to automate the QA process using NUnit and Playwright

EDUCATION

Case Western Reserve University
Cleveland, OH

BS in Electrical Engineering, Computer Science — 2020–2024
MS in Electrical Engineering — 2024–2025

PROJECTS

Mirror: A gaming-peformance remote desktop solution designed for Linux hosts (Rust, C)
2025–

- Implemented end-to-end streaming pipeline in Rust, using quiche (QUIC protocol), ffmpeg, and wgpu
- Wrote custom FFI bindings against libdrm, libgbm, and more Linux internals
- Building towards multi-user, GPU accelerated headless desktops

Research into HF propagation during solar eclipses at CWRU
2023–

- Developed high-uptime data collection tools in Rust and C, enabling simultaneous processing of 20+ real-time data streams
- Completed a Master's thesis and published a paper on the April 8, 2024 eclipse.
- Travelled to Tortel, Aysen, Chile, and Reykjavik, Iceland to record data during the October 2024 and August 2026 solar eclipses, respectively.

Telugu-English translation using the Transformer model architecture (PyTorch, Python)
2024

- Implemented transformer architecture from "Attention is All You Need" paper, built positional encoding and attention from scratch
- Replicated results on 5M English-Telugu sentence pairs and fine-tuned for conversational language, achieving 27.2 BLEU score

Multithreaded data scraper for web-based software defined radios (Rust)
2024

- Engineered async Rust system for parallel data collection from 50+ simultaneous WebSocket endpoints using thread pools (`tokio`, `tokio-tungstenite`)

HC37 NOR flash driver for OpenOCD (C)
2024

- Reverse engineered protocol for HC37 NOR flash memory on a cheap HF radio using OpenOCD and Ghidra, enabling firmware extraction and modification

Graph-based audio routing software for ASIO on Windows (C++)
2021-2023

- Achieved low-latency (< 7ms) audio routing between ASIO clients (e.g. Ableton, Reaper)

PRESENTATIONS & PUBLICATIONS

Detecting changes in along-path HF propagation during the April 2024 total solar eclipse with radio amateurs and low-cost instrumentation — 2026

Frontiers in Astronomy and Space Sciences — 10.3389/fspas.2025.1720301

Hydropower and environmental flow management: System-level trade-offs at Glen Canyon Dam — 2025

Journal of Hydrology: Regional Studies — 10.1016/j.ejrh.2025.102624