

NAUSICAA VAN WEST

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EDUCATION

The Cooper Union for the Advancement of Science and Art, New York, NY
Bachelor of Engineering, Electrical Engineering
Minor in Mathematics

Class of 2024
GPA: **4.0**

Awards received:

- ▶ Henri D. Dickinson Award
- ▶ Jesse Sherman Book Award (2x)
- ▶ Irvin Leon Lynn Memorial Prize
- ▶ Class of 1907 Award
- ▶ Charles Goodman Essay Award

Was a MATLAB instructor, covering various DSP, CAS, and programming topics (Jan 2023 – May 2024).

EXPERIENCE

Cybersecurity Software Engineer, Chip Scan Inc., Far Rockaway, NY Mar 2025 – Mar 2026

- ▶ Rewrote and expanded Chip Scan's most profitable product in Rust (from C and Go), including a Rust kernel module for a legacy Linux kernel and new data visualizations in Vega
- ▶ Implemented pipelined AES-128/256 (tested against OpenSSL) and novel multi-symbol memory ECC (along with demonstrations of functionality) in SystemVerilog
- ▶ Designed CI/CD and test architecture with distributed full-stack integration tests on multiple VMs and real hardware simultaneously
- ▶ Implemented dynamic routing via OSPF and automatic DNS registration for Chip Scan's internal network, improving resiliency
- ▶ Intercepted all of Chip Scan's network traffic using TLS proxy doing deep packet inspection
- ▶ Implemented extensive access and command logging for all systems over TLS syslog to a central server (including a dashboard and rudimentary security alerting)
- ▶ Administrated production-critical Linux and BSD infrastructure hosts, including ~200 TB of networked storage synchronized cross-country
- ▶ Implemented manual adaptive CPU usage for a low-level C application running on embedded Linux
- ▶ Advised on system design and implementation for other DoD contractors, and worked with them to run safety and functionality tests on real systems

Research Intern, Red Balloon Security, New York, NY Jun 2023 – Aug 2023

- ▶ Facilitated vulnerability patching by multiple teams on a remote-controlled IoT Linux power plug by obtaining a root shell over UART and building on-device development & debugging tools
- ▶ Designed and constructed an automated PCB photography machine for the purpose of hardware-level board analysis, decreasing user time per board by about a hundredfold
- ▶ Machined precision aluminum, brass, and steel parts for multiple projects, including a brake rotor mount

Firmware Designer, Generac Clean Energy Systems East, Westbrook, ME May 2020 – Jul 2021

- ▶ Automated code, test, and documentation generation for RPC-over-Modbus inverter control, automating ~80% of previously boilerplate work
- ▶ Collaborated with multiple teams for system architecture (operating system, data storage, and task modeling) of next-gen inverters
- ▶ Demonstrated interrupt starvation on legacy hardware, leading to a decrease in switching frequency, by building visualization tools to analyze interrupt timing data obtained via a logic analyzer
- ▶ Patched 32-bit read and write tearing due to improper synchronization in legacy inverter code, fixing observed switching and voltage errors, by implementing atomic operations in XC16 PIC assembly
- ▶ Tracked and fixed a grid-rotation mismatch bug caused by a mathematical error in the inverter blackstart code, preventing (at least some) further inverter hardware explosions
- ▶ Ensured compliance with the UL 1741 safety standard through formal thermal and electrical testing

PROJECTS

- Ribbon Microphone**, khz.ac/sound/ribbon-mic.html Sep 2024 – Nov 2024
- ▶ Designed a 3D-printed ribbon holding system capable of precisely tensioning 0.5 micron aluminum foil
 - ▶ Designed and built a low-noise preamplifier to connect the microphone to my computer
- Compressor Pedal**, for guitars Jan 2023 – present (ish)
- ▶ Wrote and filed a provisional patent application for key elements of the circuit
 - ▶ Designed and tested an analog audio compressor with best-in-class transparency across the audio spectrum to permit “set it and forget it” operation with either instruments or vocals
 - ▶ Laid out multiple custom PCBs, including SMD specifications, for ease of manufacture
 - ▶ Created a full CAD model of the pedal to check size, fit, and hole location
- Lowball** (foot-controlled trackball) Nov 2024 – present (ish)
- ▶ Designed and built toe-actuated magnetic-optical switches (five in total, each optimized for a different part of the foot)
 - ▶ Built a bearing array to support a very large wooden ball for control input
 - ▶ Wrote firmware for variable tracking speed and multiple mouse buttons
- High-Voltage Series Load Resonant Converter** Mar 2021 – Apr 2021
- ▶ Designed and built a 15 kV, 2 kW resonant converter, including custom magnetics, using mostly salvaged parts
 - ▶ Adapted SLR converter designs by Marco Denicolai and Steve Ward for available parts
 - ▶ Optimized TL494 power oscillator control and UCC37322 gate drive circuitry for noise resilience
 - ▶ Constructed a 15 kV, 2 kW, amorphous iron switching transformer, with 60 kV inter-winding insulation, using inexpensive materials
 - ▶ Implemented a power factor correcting boost converter front-end based on TI’s UCC28019A using salvaged parts

ACADEMIC

- Software-Defined Radio** (team of five), The Cooper Union Jan 2024 – May 2024
- ▶ Designed and tested multiple low-noise and power amplifiers and mixers using a spectrum analyzer & oscilloscope
 - ▶ Wrote digital signal processing code to control an RF reference and convert IF to audio, utilizing DMA for zero stutter
- Induction Tea Heater** (team of three), The Cooper Union Mar 2023 – May 2023
- ▶ Designed an oscillator and full bridge for ~100 W continuous resonant operation
 - ▶ Constructed a carefully tuned series-parallel load to avoid excess high-harmonic current
 - ▶ Analyzed several resonant load configurations to determine the most effective and most efficient operating conditions
 - ▶ Heated a cup of tea to 88 °C, a good steep temperature
- Self-Parking Car** (team of two), The Cooper Union Jan 2023 – May 2023
- ▶ Laid out a central PCB with a half-bridge motor controller, multiple buck converters, and data lines
 - ▶ Wrote an embedded Debian and bare-metal tech stack from scratch in Python & C++ for real-time motor control, remote car control, debugging, and easy extensibility
 - ▶ Worked with a mechanical engineer to optimize an existing car design
 - ▶ Extended Stanford’s Stanley motion control algorithm, allowing stable & accurate operation in reverse for the first time, by dynamically altering control loop gains
 - ▶ Automatically created and followed parking trajectories based on the position of the car, finishing before the deadline to reuse the code for Cooper’s IGVC competition car
 - ▶ Facilitated distributed system education for multiple systems at Cooper by implementing a simple general-purpose communications library in Python and C++

SKILLS

HARDWARE

Formally trained as an analog electrical engineer with a focus in signal processing.

- ▶ *Professional:* experience with oscilloscopes, 'scopecorders, function generators, and grid simulators
- ▶ *Academic:* SPICE, Vivado, Virtuoso, Keysight ADS, KiCad, vector network analyzers, and Smith charts (naturally)

SOFTWARE

- ▶ *Professional:* Rust, C, C++, Python, and Verilog; novel hardware design, Linux kernel module development
- ▶ *Personal:* Lisp, Perl, Lua, Java, ARM & x86 assembly, MATLAB/Octave

FABRICATION

- ▶ *Professional:* manual lathe and manual mill operation
- ▶ *Personal:* 2D and 3D cad (Onshape, SolidWorks, AutoCAD), 3D printing

MISC.

Pretty good at origami, singing, writing, bookbinding, and tying knots.