# Matthew Bruggeman

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## Objective

Software Engineer focused on developing performant and secure services. Proficient in programming and Cybersecurity with a strong foundation in operating system design and system administration. Seeking a challenging role to contribute expertise in building secure software and high performance systems.

## Work Experience

**Software Engineer Intern** @ **Pacific Northwest National Laboratory** — *June 2022 to present*

- Developed Rust-based services and applications to generate realistic email conversations using local LLMs, obfuscate network traffic, and provide a flexible API for other applications to consume, enabling automated, realistic simulations of enterprise communication.
- Created C++ network simulations in NS3, deploying with Docker to route traffic through physical power grid infrastructure and test LTE network topologies.
- Built a Python Linux service and accompanying Windows application to simulate external file delivery via virtual USB disks, SFTP shares, and SMTP, providing realistic scenarios for testing operational workflows.
- Implemented a high-performance Rust eBPF program to dynamically modify network packets, perform connection tracking, and spoof IP addresses to generate realistic internet traffic.
- Developed a Linux kernel module and accompanying userspace program in C to collect real-time serial data with microsecond-level precision, enabling precise analysis and framing of industrial protocols.
- Created multiple corporate web applications using the LAMP stack, styled with Bootstrap or Tailwind, integrating Kerberos authentication to enable automatic login on corporate workstations and streamline user account management and access procedures.
- Developed a service to automate LDAP account synchronization and virtual machine VNC connections by interfacing with MySQL and REST APIs to allow users to seamlessly view virtual machine displays.

**Freelance Development & System Administration** — *March 2018 to December 2021*

- Developed full-stack React and Vue interactive web applications to customer specifications integrating with Postgres or MongoDB databases, providing secure and stable APIs for customer applications.
- Hardened machines and networked services, configured firewalls and routing, and monitored systems.

## Education

**B.S. Computer Science** @ **Washington State University** – *Graduated May 2025*

- 3.9 GPA – *Summa Cum Laude*
- Coursework in systems programming, web development, Cybersecurity, databases, and algorithms.

## Skills

- Architecting high-performance networked services with robust APIs
- Developing declarative, reproducible systems optimized for reliability and maintainability
- Securing and hardening complex network infrastructures against emerging threats
- Reducing attack surfaces in existing software

## Technologies

- Rust, C, C++, TypeScript, C#, Java, Go, Python
- Full-stack web: Vue, React, Express
- MySQL/MariaDB, Postgres, MongoDB, Redis
- Systems programming: POSIX, kernel, eBPF, RT
- Debian, Ubuntu, RHEL, NixOS, systemd
- Containers: Podman, Docker, bubblewrap
- Embedded: ESP32, Arduino, Raspberry Pi