

Paul Halvorsen

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Summary

Software engineer with 15+ years of development experience building scalable systems and applications. Expertise in Python, Go, Rust, Java, and C; REST APIs; database design; and performance optimization. Experience across infrastructure, backend systems, and full-stack development. Strong foundation in automated testing, CI/CD pipelines, and distributed systems.

Technical Skills

Languages: Python, Go, Rust, Java, C, C++, JavaScript, PHP

Databases: MySQL, SQLite, Postgres

Infrastructure & Tools: Docker, Kubernetes, AWS, GitLab CI/CD, Git, Pytest, automated testing

Specializations: Systems programming, API design, performance optimization, security, TDD

Experience

Abnormal AI

Software Engineer | **January 2026 – Present**

- Microservices and data aggregation systems serving customers across US, EU, and government regions
- Python and Go backend services; REST APIs and data processing pipelines
- Kubernetes infrastructure: 10 auto-scaling clusters in AWS
- Real-time and long-term data management; aggregation pipelines for efficiency
- Performance optimization through compression and smart scaling strategies
- Cross-team collaboration in monorepo environment
- Team of 5 engineers delivering features and platform reliability

Binary Defense

Sr Software Engineer | **April 2022 – October 2025**

- Applications protecting thousands of Fortune 500 company endpoints across Windows, Linux, and macOS
- Rust development: tokio, cargo, cross-compilation, unit testing
- Python microservices: REST APIs, event aggregation, data pipelines
- Performance optimization: reduced CPU 90%, memory 60%, network traffic 80%
- Encrypted SQLite databases and secure key storage
- GitLab CI/CD pipelines with Docker (Linux/Windows) and VM testing
- Public key pinning and certificate transparency for secure API design
- Designed RFCs and architecture decision records driving technical direction

Kyrus Tech

Sr Software Engineer | **November 2020 – April 2022**

- Test-driven development: C, Python/Pytest, Docker, GitLab CI/CD
- Covert communications proxy: HTTPS, Apache Thrift, REST APIs
- Router fingerprinting and vulnerability analysis on Android platforms
- Linux kernel modifications for system monitoring

Parsons

Cyber Security Software Engineer | **April 2018 – November 2020**

- Modular Windows application in C, C++, Python with distributed plugin architecture
- Custom API design for minimal bandwidth communications
- AES-encrypted storage and communications
- Backend file storage service: Java, Tomcat, NiFi, nginx, Hadoop, MySQL, LDAP, RBAC
- File upload APIs and metadata generation for search functionality

NSA

Security Software Engineer | **November 2011 – April 2018**

- Browser security platform: PHP, JavaScript, jQuery, Python, MySQL, Java
- REST and JSON APIs for data transfer between targets and backend servers
- Dynamic UI with real-time data visualization, graphs, and charts
- MySQL database design and optimization for enumeration and exploitation data
- Vulnerability mitigation strategies for military and government customers
- Training and documentation for operators and developers

Systems Engineer | **September 2009 – November 2011**

- Deployment and maintenance of 30+ systems with 130+ RHEL servers
- LDAP, DNS, Apache, NiFi, Hadoop, Puppet, DHCP, PXE services
- Python monitoring, reporting, and issue correction scripts
- 24x7 call-in rotation rotation coordination and team training

Salisbury University

Software Developer | **November 2006 – May 2008**

- Simplified UI and scenario builder for Satellite Tool Kit (STK) in Managed C++
- Risk assessment scenarios for launch vehicles and UAVs
- GIS collaboration for mapping and visualization

Lab Administrator | **September 2007 – May 2009**

- Linux lab maintenance: dual boot OpenSUSE/WindowsXP, server administration
- Backups, updates, user management (LDAP), disk quotas, remote access

Open Source & Personal Projects

- **testct & ctclient** (Rust) – Certificate Transparency testing and monitoring tools
- **sjles-pta-vote** (Go, TypeScript, React) – Full-stack community voting platform
- **baseball-nn** (Python) – Machine learning project with neural networks
- **date-scanned-pics** (Python) – EXIF metadata utility for photo organization

Education

- **Master of Science, Computer Science** – University of Maryland Baltimore County (2013) Thesis: “Stateless Detection of Malicious Traffic: Emphasis on User Privacy”
- **Bachelor of Science, Computer Science** – Salisbury University (2009) Magna Cum Laude
- **Royal Military College (RMC Canada)** – Training in OpenBSD development and administration

Additional

- Presentations: RedBlue Conference (web enumeration/exploitation), NCUR (STK scenario development)
- SANS courses for current security research
- Homelab: Proxmox virtualization, email, cloud storage, DNS, multimedia, genealogy, web services