Alexander Portland

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Education

Brown University
May 2026 *(expected)*

Sc.B. in Computer Science, A.B. in International and Public Affairs, **GPA: 3.98 / 4.0**

- CRA Outstanding Undergraduate Researcher Award Nominee (2025, 1 of 4 from Brown)
- **Relevant Coursework:** Programming Languages, Computer Systems, Operating Systems, Multiprocessor Synchronization, Computer Networks, Software Security, Theory of Computation

Publications

K. Dak Albab, A. Agvanian, A. Aby, C. Tiffany, **A. Portland**, S. Ridley, M. Schwarzkopf. *Sesame: Practical End-to-End Privacy Compliance with Policy Containers and Privacy Regions*. Proceedings of the 29th ACM Symposium on Operating Systems Principles (SOSP '24). November 2024.

Experience

Amazon Web Services, *Software Engineering Intern*
June 2025 - Sep 2025

Achieved **4x speedup** to the compiler of *Kani*, an open source Rust verification tool with **>200k downloads**.

- Improved codegen with dynamic caching, ordering heuristics, and selective compilation.
- Designed a highly-parallel scheme for the thread-safe sharing of codegen data structures with **<10% synchronization overhead**.
- Contributed to the upstream Rust language, enabling efficient hashing of compiler internals.
- Identified 22 other small engineering inefficiencies, together **contributing 1.52x** of the 4x speedup**.**

Brown University Systems Research Group, *Research Intern*
Dec 2023 - Present

Leading development of **a Rust linting framework** that uses function annotations to document and **check essential code properties** (e.g. UB-free, panic-free, non-blocking) for safety-critical applications.

- Collaborating on integration and adoption into high-profile crates like *ZeroCopy*.

Improved **process sandboxing** for *Sesame*—an ergonomic framework for privacy enforcement in Rust apps.

- Engineered a method for secure multithreaded sandbox reuse, **reducing setup times by ~6.5x.**
  - Built on Firefox's RLBox library (in C++) with a custom Rust → Wasm → C compilation toolchain.
- Built an algorithm for **~500x faster data transfer** into sandboxes than existing serialization methods.

Brown University Computer Science Department, *Head Teaching Assistant*
Dec 2023 - Present

Teaching CS0300: Intro to Computer Systems; CS1650: Software Security & Exploitation

- **Hired, trained, and managed 24 TAs** for over 200 students.
- Led weekly sections teaching C++ in Linux to 20+ students, assisted with grading, & held office hours.
- Evaluated as “exceeding expectations” in all categories & **“very, very communicative”**.

State of Rhode Island, *Endpoint Management Intern*
Aug 2023 - Dec 2023

- Provided endpoint tech support to **18k state employees** using the ServiceNow ticketing system.
- Coordinated the removal of **300+ redundant devices** from the State's Intune and SCCM networks.

Skills

Programming: Rust (Advanced); C, C++, Java, C# (Proficient)

Systems & Tools: Linux, GDB, Valgrind, perf, benchmarking, sandboxing, Wasm, Git, static analysis

Languages: French (Intermediate); Arabic (Beginner)