Mara Dominguez

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EDUCATION

Columbia University **May 2025**

B.A. Computer Science

- Dean's List 2021-2023, 3.75/4.0 GPA
- Relevant Coursework: Operating Systems, Computer Networks, Advanced Systems Programming

Experience

Software Engineer Intern **May 2024 - August 2024**

Fastly *San Francisco, CA*

- Optimized and redesigned a critical Rust subsystem, decreasing memory usage by 40% and increasing readability
- Profiled the program using flamegraphs, coz, and strace to find expensive operations
- Collaborated with mentor for design decisions and project direction

Linux Kernel Research **January 2024 - May 2024**

Columbia University Systems Programming Lab *New York, NY*

- Analyzed Linux kernel code & re/implemented syscalls to work with (currently confidential) security-based virtualization framework
- Participated in weekly meetings and led collaboration with other undergraduate research assistants

Compression By Function **December 2023 - Present**

Personal Project Repo

- Command Line tool for losslessly encoding files as a polynomial in Rust
- Consulted with Mathematicians and Professors to optimize program
- Personal Project to practice design, learn more about cryptography, and ideally compress arbitrary data

Relevant Coursework

Operating Systems I **Sept 2023-Dec 2023**

- Learned about Operating Systems Theory & Practice within the context of the linux kernel
  - Processes, Scheduling, Memory Mapping, and Filesystems
- Found lines in the kernel source code where important kernel responsibilities were handled
- Wrote scheduling class, shadow page table trace, and syscall trace, and simple filesystem kernel patches in C

Computer Networks I **Sept 2023-Dec 2023**

- Learned anatomy of fundamental protocols such as CDN, TCP, UDP, HTTP, Routing algorithms, SDN, network load balancing protocols, etc.
- Wrote reliable chat app over UDP in C
- Wrote implementation of Bellman Ford Algorithm and the Go-Back-N Protocol over UDP in Rust

Advanced Systems Programming **Jan 2024 - May 2024**

- Learned implementation details of fundamental libraries in C, and intricacies of userspace UNIX
- Reimplemented Malloc, limited function gdb, simple linker

SKILLS & INTERESTS

- **Skills:** C, Rust, C++, Java, Python, Pandas, Tensorflow, Pytorch, LAMP, Prometheus, Git, Linux/*nix, Networking, Fluent in Spanish, Basic Mandarin
- **Interests:** Jazz Piano, Saxophone, and Guitar, Lion Dance, Knitting, The Legend of Zelda