Hans J. Montero

Personal Information

Homepage: cs.columbia.edu/~hans Email: hans@cs.columbia.edu
LinkedIn: linkedin.com/in/hjm2133 GitHub: github.com/hmontero1205

Education

September 2021 - October 2022
Masters of Science in Computer Science
Concentration in Software Systems
Columbia University – New York, NY
4.1 GPA

September 2017 - April 2021
Bachelor of Science in Computer Science
Minor in Applied Mathematics
Columbia University – New York, NY
4.1 GPA, magna cum laude

Relevant coursework: Hypervisors, Operating Systems, Programming Languages, Distributed Systems, Computer Networks, Design with C++, Databases, Database System Implementation

Skills

Languages C++, C, Python, Golang, Bash, OCaml, Haskell, JavaScript, HTML/CSS
Technologies Unix, Linux Kernel, Git, Amazon S3, Kafka, Cassandra, Graphite, Splunk, Google Cloud Platform, libGDX, Netty, MySQL, phpMyAdmin

Work Experience

- Software Engineer @ **Google** – New York, NY
  June 2022 -
  Cloud Techinfra, Microsecond Colossus Filesystem
  Deliver low-latency and high-reliability SSD reads/writes. Reduce network-attached disk server CPU/memory utilization via remote direct memory access ops. Infrastructure written in C++.

- Software Engineering Intern @ **Google** – Remote
  May 2021 - August 2021
  Cloud Techinfra, Linux Kernel Networking: eBPF in Production
  Introduced code profiling of packet classification and measurement eBPF programs in C/C++. Optimized eBPF programs to reduce per-packet processing time. Wrote Linux Kernel patch that provides fast storage for eBPF programs as a configurable optimization.

June 2020 - August 2020
Cloud Sysinfra Platforms, SW Accelerators: XLS
Improved the DSL's functional frontend's support for type-parametricity (frontend written in Python). Added a validation feature that runs tests through frontend/IR execution engines and compares results. Implemented a QuickCheck mechanism for the DSL using the backend's C++ toolchain and a LLVM JIT.

- Software Engineering Intern @ **Bloomberg L.P.** – New York, NY
  May 2019 - August 2019
  Communication Channels Systems Reliability
  Helped develop a Chaos Engineering testing framework built in Python with Kafka and Cassandra. Created a reporting service for the chaos framework to present system and experiment metrics. Assisted in bug fixes and improvements for C++ and Python backend services.

Teaching Experience

- Associate in Computer Science @ **Columbia University** – New York, NY

Fall 2024 — *cs4995.004: Advanced Systems Programming*
cs4157.github.io/www/2024-9

Spring 2024 — *cs4995.008: Advanced Systems Programming*
New course offering, co-designed with Prof. Jae Woo Lee.
cs4157.github.io/www/2024-1

Spring 2023 — *cs4118: Operating Systems I*
cs4118.github.io/www/2023-1

- Head Teaching Assistant @ **Columbia University** – New York, NY

Fall 2020 – Spring 2022 — *cs4118: Operating Systems I*
Helped develop and maintain Linux kernel assignments: custom FIFO scheduler, disk-backed filesystem, syscalls for inspecting process state, in-kernel data structures requiring use of synchronization mechanisms. Upstreamed assignments for Linux releases 4.19.50 and 5.10.57. Led recitation sections that covered Linux kernel development.

Fall 2018 – Spring 2022 — *cs3157: Advanced Programming*
Known as Columbia's "Systems Programming Course with a Narrative". Sysadmin for Linux server students work on (handled student onboarding, updated daemon services). Maintained lab grading scripts written in Bash.

Spring 2021 — *cs4115: Programming Languages and Translators*
Advised teams on their language design and compiler project in OCaml/LLVM.

Summer 20{21,22} — *cs4995: C++ for C Programmers*
Helped develop new class materials (assignments, exams, infrastructure).

- Learning Advisor @ **Codecademy** – New York, NY

May 2018 - December 2018 — *Online Pro Intensive Courses*
Support learners on a 1:1 basis in Java, Python, JavaScript, and HTML/CSS. Review project submissions on GitHub and provide code feedback for learners. Moderate Slack workspaces of over 300 learners and offer guidance as users complete courses and create supplementary learning materials.

Selected Projects

January 2019 – May 2019 — `rippl` – Recursively Inferred Pure-functional Programming Language
Wrote a functional, strongly and statically typed programming language with four classmates. Compiler written in OCaml with C libraries and targets LLVM IR - Features: Hindley-Milner type system, lazy evaluation, list comprehensions.

Summer 2020 — `pygrader` – Generic grading framework for coding assignments
Created a grading framework in Python to help TAs grade more consistently and effectively. Used by Columbia teaching staff in cs4118 Operating Systems and cs4995 C++ for C Programmers.

Research Experience

June 2021 – February 2022 — `sslang` – Sparse Synchronous Language
Collaborated with PL research group at Columbia on development of Sparse Synchronous Model. Implemented parsing, AST transformations, and lambda lifting modules for compiler in Haskell.

Awards

Fall 2021 – Spring 2022	**Course Assistant Fellowship** - Columbia CS Department Distinction awarded to few graduate- level course assistants for comprehensive experience.
June 2021	**HSF Scholar** - Hispanic Scholarship Fund
April 2021	**Excellence in Teaching and Service** - Columbia CS Department Outstanding contributions to teaching and exemplary service to the Columbia CS Department and its mission.
April 2021	**Senior Marshal, Innovation and Enhancement Award** – Columbia Uni. Improved the teaching and curriculum of the Columbia CS Department
November 2019	**Engineering Honor Society** - Tau Beta Pi (NY Alpha Chapter)
May 2017	**Top 3 Coding Team** – St. Joseph's College HS Programming Competition Competed amongst 50 teams from the greater NYC area. Solved algorithm problems in Java and judged on program performance. Finished in 3rd Place.