Kaiwen Xue (Kevin)

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Computer Science, QPA: 3.95/4.33 — 2022.9–2023.12 (Expected)

Columbia University* — New York, NY
Bachelor of Arts, Major: Computer Science, GPA: 4.03/4.33, *summa cum laude* — 2020.9–2022.5

City University of Hong Kong* — Hong Kong
Bachelor of Science, Major: Computer Science, GPA: 4.03/4.33, *First Class Honours* — 2017.9–2020.5

**Joint Bachelor's Degree, equivalent to completing the degree at either institution*

Most Relevant Courses: Operating Systems (Columbia W4118), Distributed Systems (CMU 15-440), Compiler (Columbia W4115), Computer Networks (CityU CS3201), Database (Columbia W4111), Functional Programming (Columbia W4995)

SKILLS

- Programming Languages: C, C++, Go, Python, OCaml, Haskell, Java, RISC-V Assembly
- Technologies: Git, Linux kernel, QEMU, OpenSBI, RISC-V Architecture
- Natural Languages: English (Bilingual Proficient), Mandarin and Cantonese Chinese (Native)

EXPERIENCE

Rivos Inc. — Mountain View, CA
Member of Technical Staff Intern - Software — 2023.5-2023.8

- Improved full-stack software support for RISC-V Performance Monitoring Unit (PMU)
- Implemented 3 RISC-V Instruction Set Architecture (ISA) extensions related to PMU on Linux kernel, QEMU, and OpenSBI
- Reduced context switch cost by 64% and end-to-end runtime of `perf` command line tool on QEMU by 3.5%
- Sent Linux kernel, QEMU, and OpenSBI patches to corresponding mailing lists for upstreaming discussion

Columbia University — New York, NY
Teaching Assistant - W4118 Operating Systems I — 2021.9-2022.5

- Cooperated with a teaching team of 8 to mentor a graduate-level 120-student class composed of advanced UNIX programming, operating systems concepts, and Linux kernel hacking for two consecutive semesters
- Held office hours, graded homework and exams, and maintained assignments on Linux kernel programming
- Received over 4.5 out of 5.0 in individual TA evaluation submitted by students

SELECTED PROJECTS

Confidential Virtual Machine Live Migration — New York, NY
Columbia University, Research Project — 2021.6-2022.5

- Extended feature of SeKVM, a secure cloud Kernel-based Virtual Machine (KVM) hypervisor enabling a software-based confidential virtual machine (VM)
- Re-implemented SeKVM on multiple Linux kernel versions and ARM hardware
- Designed VM live migration on SeKVM, keeping VM downtime at less than 3X of vanilla KVM
- Devised a shared mapping kernel data structure to support migrating pages VM shared with hypervisor and implemented it in KVM and QEMU

Pseudo Code Language Compiler — New York, NY
Columbia University, Course Final Project, W4115 Programming Languages and Translators — 2022.2-2022.5

- Led a team of 4 to develop in OCaml a compiler for CLeuRoS, a pseudo-code-like programming language
- Designed high-level syntax of CLeuRoS and documented it in a language manual
- Implemented lexer, parser, and semantic checker using ocamllex and ocamlyacc
- Constructed a code generator converting abstract syntax tree into LLVM IR, supporting I/O, control flow, and basic data structures