JONATHAN LAM

Software Engineer
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EDUCATION

The Cooper Union for the Advancement of Science and Art New York, NY — September 2018 - May 2022
M.Eng., B.Eng., in Electrical Engineering, Computer Engineering Track;
Minor in Computer Science; Cumulative GPA: 3.99/4.00

Coursework Operating Systems, Compilers, Program Analysis, Computer Architecture, Cloud Computing, Cybersecurity, Databases, Communications Networks, Deep Learning, AI

Activities & Awards Math and CS Tutor, Ping Pong Club President, CUCC Student Operator, ACM ICPC Participant, IEEE×ACM Club Officer, Norman Perry Award, Jesse Sherman Award, Howard Flagg Memorial Prize, Harold S. Goldberg Leadership Prize, Henri D. Dickenson Award

EXPERIENCE

Google Silicon, Pixel TPU Runtime Team Mountain View, CA — August 2022 - January 2023
- Developed and presented a prototype C++ "performance HAL" that significantly reduces tail latencies and slightly improves across-the-board latencies when compared to existing runtime.
- Developed an generalized Perfetto trace analysis framework to improve performance insights.
- Investigated additional opportunities for performance improvements using standard Linux APIs.

University of Michigan, Future of Programming Lab Ann Arbor, MI — October 2021 - May 2022
- Designed and implemented (mostly performance-related) improvements to evaluation and hole instance numbering in Hazel, an experimental live programming environment with typed holes.
- Demonstrated an exponential speedup in certain examples due to memoization of environments.
- Prototyped the fill-and-resume optimization initially described in Omar et al. (2019).

MathWorks, Software Engineer Intern Natick, MA — May 2021 - August 2021
- Collaborated with two teams to develop a R&D prototype for a new workflow that bridges existing user-facing interactive editing workflows.

The Cooper Union, MATLAB Instructor New York, NY — February 2021 - May 2021
- Taught and developed materials for ECE210: MATLAB Seminar, an introduction to MATLAB with applications from the corequisite course ECE211: Signals and Systems.

Express Scripts, Software Engineer Intern Bloomfield, CT — May 2020 - August 2020
- Won second-place intern project for a browser extension that encourages better WFH productivity.
- Refactored redundancies in existing Angular projects to improve deployment speed and consistency.

PROJECT WORK

Compiler for an untyped lazy pure functional language — January 2022 - May 2022
- Implemented a front-end (lexer and LL(1) parser) and two back-ends (template instantiation evaluator and G-Machine compiler) in Haskell for a compiler for Core, an untyped Haskell-like toy language.

C99 Compiler — February 2021 - May 2021
- Developed a C compiler comprising a lexer (Flex), LALR(1) parser (Bison), three-address quad generation, and x86_64 target code emission implementing most of the C99 standard.

Variations on a Scheme: Multiple First-Class Continuations — August 2021
- Explored first-class continuation implementations and use cases, and compared to similar constructs.
- Extended the call/cc interface in Scheme to support multiple simultaneous continuations using CPS.

Intrinsic Dimensions of Objective Landscapes — November 2020 - December 2020
- Extended the work of Li et al. (2018) to find a lower minimum parameterization of the objective landscape of deep neural networks.
- Achieved a lower parameterization by using a nonlinear Fourier-coefficients transform.

VEIKK Digitizer Driver — July 2019 - August 2020
- Developed an open-source Linux driver for VEIKK digitizer tablets using USBHID kernel API.
- Built an accompanying C++ configuration GUI tool featuring button, pressure, and screen mappings; employs systemd libevdev, udev, uinput, Qt5, and (q)dbus Linux APIs.

TECHNICAL SKILLS

Languages C++, C, Python, Javascript, Java, Scheme, SQL, Haskell, OCaml, MATLAB, x86_64 Assembly, Rust, Golang

Familiar Technologies Linux, BSD, Node.js, TypeScript, Angular 2+, Vue, React, Sass, Redux/NgRx, jQuery, Matplotlib, Numpy, Pandas, Tensorflow, KVM/QEMU, LaTeX, CUDA, AWS, MEAN/MERN/LAMP, LLVM, Perfetto, (simple)perf