ALAIN LOU

ECE, UNIVERSITY OF WATERLOO

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SKILLS

LANGUAGES: Bash, C, C#, C++, Java, JavaScript, Perl, Python, RISC-V, Rust, Verilog/SystemVerilog, VHDL
FRAMEWORKS: cocotb, CppUTest, Litex, oneAPI, OpenCL, SYCL
TOOLS: AWS, Azure, CMake, GDB, Git, Linux, Logic Analyzer, Perforce, Quartus, Soldering, Vivado

EMPLOYMENT

Intel Sept. 2021 - Current
IP Design Intern, External Memory Interfaces Toronto, Canada
- Features for Platform Designer (Quartus) and memory subsystems for Intel FPGAs

University of Waterloo May 2021 - Aug. 2021
Research Assistant (part-time), Configurable Arch. Lab Waterloo, Canada
- Investigating area and performance characteristics of Efinix FPGA architecture
- Python and Tcl scripting, OpenCV to extract metrics not available in tool reporting
- Paper planned for FCCM 2022

Intel Jan. 2021 - May 2021
FPGA Software Engineering Intern, High Level Design Toronto, Canada
- Improving performance, usability and code quality of OpenCL and SYCL products for Intel FPGAs
- Implemented USM host allocation use-after-free detection and warning, reset FPGA kernels on host program exit
- Ground-up rewrite of build system for FPGA runtime, using modern CMake, deleting 2.5k lines of Make code
- Addressed release gating issues: error in compiler, installation script shell compatibility and functional errors in SYCL designs
- Used GDB, OpenCL Intercept Layer and VS Debugger; gained knowledge about GCC, LD, MSVC and Quartus
- Group-wide triager for regression test failures in HLD products

Microsoft May 2020 - Aug. 2020
Explore Intern, OneDrive + SharePoint Redmond, WA
- PM and SWE in feature development lifecycle of datetime formatting and boolean rendering features in Microsoft Lists
- Collaborated cross-team to create design (Figma) and PM specs, iterating through user feedback, design critiques, spec reviews
- Implemented new web components using React, Fluent UI and the JavaScript Date API
- Wrote library functions to deal with localization, internationalization and timezone conversions

University of Waterloo Jan. 2020 - Apr. 2020
Research Assistant (part-time), Intelligent Connectivity Lab Waterloo, Canada
- Developed platform for distributed RFID readers, using Raspberry Pi running Windows 10 IoT and .NET framework
- Used Octane SDK for Impinj RAIN RFID reader and Azure services to build batch data pipeline
- Webapp GUI using d3.js frontend and Azure VM running nginx, gunicorn, flask, cronjobs for batch processing

PROJECTS

6502 Aug. 2021 - Current
- Implementation of MOS 6502-compatibile processor using modern digital design tools (SystemVerilog, cocotb testbench)

Synth Apr. 2021
- All-digital monophonic square wave synthesizer, using a single clock domain
- 115 200-baud UART TX/RX

Pong Feb. 2021 - Mar. 2021
- Pure hardware implementation of Pong on an FPGA board
- 480x640 1-bit VGA controller, 7-segment scoreboard, ALTPLL

EDUCATION

University of Waterloo Sept. 2018 - Apr. 2023
Candidate for BASc Computer Engineering
- Dean's Honours List x2
- President's Research Award x2
- Mentor in Tech+, ECE Society; UW Engineering Ambassador
- ECE 327 Hall of Fame (systolic array matrix multiplication on FPGA)