

William Zhang

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TECHNICAL EXPERIENCE

Simon Fraser University

Apr. 2023 – Aug. 2023

FPGA Machine Learning Research Assistant

Burnaby, BC

- Designed a **FPGA neural network compiler** that translates mobilenetv2 networks to RTL. These FPGA neural network accelerators can achieve 5x higher power efficiency with similar performance.
- Developed and implemented register renaming on the open-source **TAIGA RISC-V** project resulting in a 50% decrease in LUT resources per register while maintaining the same throughput.

Epic Semiconductors

Sep. 2021 – Apr. 2022

Embedded Systems & Silicon Design Engineer

Vancouver, BC

- **Implemented firmware** of a battery-free, self-powering, and bidirectional sensor module in **Assembly and C** featuring custom drivers and meeting the maximum response time of 3ms.
 - Increased communication bandwidth from **24kbs to 32kbs** on an 8MHz chip.
 - Fulfilled all design requirements including synchronization, security, and UI while using ~2mA.
- **Designed digital partition of a mixed signal ASIC** on the 65nm TSMC process and decreased the size by 20%.
- Redesigned electronics for a product emulator **decreasing power consumption by 16%**, better emulating the real product.
- Suggested and created development PCBs that decreased application development time by 90%.

Algo Communication Products

Jan. 2020 – Apr. 2020

Production Engineering Co-op

Burnaby, BC

- Diagnosed PCBs on a hardware level using software and physical tools, decreasing production errors by 2%.
- Selected by lead to replace an outdated inventory management system that ultimately decreased inventory mistakes by 23%.

TECHNICAL PROJECTS

Smart Dragon Boat Paddle (Capstone Project)

- Designed electronics and **PCBs using Altium** to facilitate tracking of metrics such as stroke rate, power output, stroke length, and synchronicity.
 - Achieved **±2cm accuracy 3D motion tracking**, with moving reference points.
- Developed the signal processing pipeline to convert raw data signals into actionable metrics.
 - This pipeline could collect all 8 metrics with a maximum **SNR of 1:12**.

A Box with Rounded Corners (TreeHacks [Stanford] Moonshot Winner)

- **Winner of Moonshot Prize**, (VMWare) Innovation, (Mage) Best Use of ML with Mage, and (Matrix) Best Application of Crypto Awards.
- Idea: To turn waste heat generated from crypto mining into heating buildings.
- Prototyped hardware module in 48 hours for controlling building heating capable of recuperating 40% of energy costs.

RISC-V Processor on FPGA

- Implemented the full RV32I Instruction Set in digital logic (**VDHL**). Emulated soft processor on an **Altera Cyclone FPGA**.
- Created and tested emulated processor for functional and timing correctness using **ModelSim**.

EDUCATION

Simon Fraser University

Jan. 2024

Bachelor of Applied Science - Computer Engineering Concentration

Burnaby, BC

- Co-operative Education, Engineering Student Society Director, SFU Satellite (Computing Team)

SKILLS & INTERESTS

- **Languages:** C++, C, Python, VHDL, Verilog, MATLAB, C#, Assembly, HTML/CSS, TypeScript, R
- **Microcontrollers/FPGAs:** Xilinx (Zynq, Alveo), Altera, Arduino, ESP32, Teensy, Attiny, PIC, STM32, MSP430
- **Frameworks:** Vitis HLS, FreeRTOS, Arduino, React, TensorFlow, next.js, Firebase, MongoDB, React Native
- **EDAs:** Synopsys, Cadence, Altium, Eagle, KiCad, Fusion, SolidWorks, Vitis
- **Interests:** Hackathons, Indie Game Development, 3D Printing, Laser Communications, Dragon Boating