

Vincent Cheng

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EDUCATION

Toronto Metropolitan University

BEng, Computer Engineering (Co-op)

Toronto, ON

Sept 2022 – April 2027

- Achieved **Dean's List** recognition (2022 - 2025)
- Activities and Societies: **TorontoMet Robotics Team – Electrical Lead**

SKILLS AND PROFICIENCIES

Languages: Python, C, C++, VHDL, SystemVerilog, Java, Perl, HTML, CSS, JavaScript, SQL

Tools: Oscilloscopes, BERTs, Waveform Generators, Git, GitHub, VSCode, Perforce, Microsoft Office

EXPERIENCE

SerDes PHY Hardware Validation Engineer Intern

Advanced Micro Devices, Inc. (AMD)

May 2025 – August 2026

Python, C, C++, Linux, Oscilloscopes, BERTs, Jenkins

- Supported integration and validation of third-party **USB, PCIe, and DisplayPort PHY IP** onto AMD SoCs, spanning pre-silicon development and post-silicon debug.
- Built **AI-assisted tools**, including an **LLM-based signal integrity report analysis tool** and **workflow automation** adopted by the team for PHY debug.
- Developed **Python and C scripts** across **Windows and Linux** environments for PHY register access and configuration, supporting USB and display link validation.
- Supported **board bring-up** and post-silicon validation using **oscilloscopes** and lab equipment, capturing **eye diagram** and **receiver lane margining** data to verify compliance with design specifications.
- Led a **signal integrity investigation** with an external IP vendor, isolating the root cause of a link failure through controlled experiments, then validated the resulting **firmware fix on silicon**.
- Developed and executed the **firmware encryption process** for USB, display, and PCIe IP across the 3PIP team to permit secure integration onto SoCs.

Front End Web Developer - Internship

Anvil Business Center

March 2024 – July 2024

React.js, Bootstrap, HTML5, CSS3, JavaScript

- Developed an interactive and fully responsive website, boosting user traffic by 31% through SEO strategies.
- Leveraged React.js and Bootstrap to build reusable components and manage application state, to improve code maintainability and development efficiency

PROJECTS

ScopeChat | Python, OpenAI API, PyVISA, Typer, Rich | AMD Intern Innovation Event Winner

- Developed an AI-powered CLI tool enabling natural language control of oscilloscopes, reducing the learning curve of oscilloscopes.
- Implemented LLM function calling to translate user queries into structured instrument commands, supporting measurements, signal quality analysis, and eye diagram setup.
- Designed a modular architecture separating CLI, LLM interface, and instrument control, with a mock mode for hardware-free development and testing.

AI Sign Language Kiosk | Python, PyTorch, scikit-learn, MediaPipe, OpenCV, NumPy | Engineering Capstone

- Built the **sign language recognition pipeline** for a capstone **AI communication kiosk**, classifying **27 ASL signs** from MediaPipe hand and body-pose landmarks across 750+ signer videos.
- Engineered **body-relative location features** in a signer-centred coordinate frame and trained a **PyTorch GRU** sequence model with on-the-fly **data augmentation** (time warping, rotation, landmark jitter), parallelized with **multiprocessing** for a **2.1× training speedup**.
- Designed a **temperature-calibrated ensemble** combining **Random Forest** and **GRU** models, reaching **92% accuracy** on held-out signers; **confidence-based abstention** further cut accepted-prediction errors.
- Validated results with a **signer-disjoint evaluation** framework using multi-seed runs and **paired t-tests**, catching a 4-point optimistic bias in early results.

Simple General-Purpose Processor Design | *VHDL, Quartus II, FPGA*

- Designed and implemented a simple general-purpose processor using VHDL, Quartus II, and an FPGA board.
- Developed key components, including an Arithmetic and Logic Unit (ALU), a Control Unit with a Finite State Machine (FSM), and a 4x16 Decoder.
- Utilized microcode operations to control arithmetic and logic processes, with outputs displayed on seven-segment displays.

Transistor Amplifier Design | *BJT, AC/DC Coupling*

- Designed, simulated, analyzed, implemented, and tested a single-supply, multistage, inverting, transistor amplifier.
- Conducted calculations for resistance, capacitance, and biasing, and verified results through simulations.