Caleb Joseph

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Education

Bachelor of Engineering, Computer Engineering (Co-op) Toronto, ON

Toronto Metropolitan University *Sep. 2021 – Apr. 2026 (Exp.)*

- **Relevant Courses**: Digital Systems, Software Systems, Computer Organization & Architecture, Electronic Circuits, Data Structures, Embedded Systems, Object-Oriented Programming (OOP), Solid State Physics, Operating Systems

Technical Skills

Languages: Python, Java, C/C++, SQL, VHDL, System Verilog, Verilog, TCL, JavaScript, Perl, Bash/CSH, HTML/CSS
Technologies: Arduino, Multisim, Simulink, Intel Quartus II, ASIC/FPGA, RTL, UVM, Linux, UNIX, CoPilot, MATLAB, RTL
Frameworks, Dev. Tools & Libraries: React, Node.js, Flask, JUnit, Git, VS Code, Visual Studio, NumPy, Matplotlib, JSON
Other: Assembly, Verification, Validation, Debugging, Scripting, CSIM, CMOS, CODEC, PCIe, GPU, Perforce, PC Gaming

Experience

Video Domain Engineer (Co-op) May 2024 – Present

Advanced Micro Devices (AMD) *Toronto, ON*

- Standardized a custom report generator for design verification regressions, resulting in a 30% reduction in error reproducibility steps and a 40% faster error identification.
- Contributed to the development of a dynamic scheduler for parallel execution of design verification regressions, enhancing resource usage efficiency by 80% and decreasing by 50% report generation time.
- Supported graphics encoder design verification by setting up a UVM test bench utilizing SystemVerilog and Verti.
- Orchestrated a full-stack solution using React, Node.js, Python, JSON, and ThreadPoolExecutor to enhance software security, implementing CodeQL for static testing and reducing runtime by 50% through parallelized Git commits.
- Implemented GitHub Copilot for streamlined frontend development, including UI creation, code generation, refactoring, and real-time vulnerability detection with AI-driven suggestions.
- Implemented Python script using RegEx, contributing to a 30% reduction in setup time for custom regressions.

Information Technology Intern May 2023 – Aug. 2023

Environics Analytics *Toronto, ON*

- Spearheaded donation of 30+ laptops, enhancing knowledge of computer software architecture, including BIOS, OS, and drivers, ensuring data integrity via secure boot and UEFI, and showcasing hardware diagnostics.
- Resolved firmware incompatibility for 150+ internal phones, resulting in an annual cost savings of $5,000.
- Automated a Python script for inventory management and cost allocation, providing dollar-cost for 300+ assets.
- Contributed to the deployment of 10+ software packages, gaining command line and PowerShell experience.

Projects

Multi-stage RISC Pipelined Processor | *VHDL, Quartus II, Cyclone-IV EP4CE115F29C7*

- Developed a 32-bit 3-stage pipeline RISC CPU in Quartus II using VHDL on an Altera DE2-115 FPGA board.
- Designed and simulated a register set, program counter, ALU, data path and control unit, leveraging concepts related to the instruction set architecture, register transfer and control hardware to fulfill a RISC process element.
- Analyzed synthesis through Quartus targeting the DE2-115 development board with a >50MHz target frequency.

Transistor Amplifier Design Project | *Multisim*

- Constructed and tested a single-supply, inverting transistor amplifier circuit in Multisim with a no-load voltage gain of 51, and implemented a stable two-stage CE-CC amplifier for optimal circuit performance..

Bookstore Application Design Project | *Java, JavaFX, JUnit*

- Led a team in developing a JavaFX Bookstore App incorporating UML diagrams, state design patterns, and a user-friendly GUI with a secure login system using efficient file parsing scaled with customer and owner objects.
- Applied organizational skills, problem-solving, & verbal communication for a 100% design documentation grade.

Helicopter Escapes | *Python, Jupyter Notebook, Wiki API, SQL*

- Interpreted escape data using Python, implementing dynamic bar plots for enhanced communication of complex trends and demonstrating algorithmic proficiency through nested loops and conditional statements.

Bluetooth RC Robot Car | *C, C++, Arduino UNO, L298 Motor, HC-05 Module*

- Engineered a Bluetooth-controlled RC robot car with Arduino, enabling remote control from smart devices.