

# CALEB JOSEPH

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## EDUCATION

### Bachelor of Engineering, Computer Engineering (Co-op)

Sep. 2021 – Apr. 2026 (Exp.)

Toronto Metropolitan University

Toronto, ON

- **Relevant Courses:** Digital Systems & Software, Computer Architecture, Electronic Circuits, Data Structures & Algorithms, Embedded Systems & Microprocessors, Object-Oriented Programming (OOP), Solid State Physics
- **Affiliations:** National Society of Black Engineers, ColorStack, Career Pathways Program, IEEE TMU, IEEE CSTMC

## TECHNICAL SKILLS

**Languages & Scripting:** Python, C/C++, VHDL, Java, SystemVerilog, Verilog, TCL, Perl, Bash/CSH, Cron

**Verification Tools & Technologies:** UVM, VCS, Verdi, MATLAB, Intel Quartus II, Linux, UNIX, Simulink, Arduino, Git

**Other:** Verification, Validation, Debugging, Scripting, CMOS, Digital Systems, VLSI Design, Digital Design, Test Coverage, ASIC/FPGA, RTL, Synthesis, Timing Analysis, SoC, Linting, CODEC, Pipeline, Code-coverage, Firmware, Testbenches

## EXPERIENCE

### Design Verification Intern (Video Domain)

May 2024 – Present

Advanced Micro Devices (AMD)

Toronto, ON

- Standardized a custom report generator using Python and RegEx for design verification regressions, reducing error repeatability by 30% and accelerating error identification by 40%.
- Collaborated with 6+ cross-functional teams, including architects and design engineers, to implement verification strategies and troubleshoot critical bugs in regression flows, resulting in a 20% reduction in build failures
- Optimized automated design release flows using Bash, Perl, and TCL, improving efficiency by 2 hours per week.
- Contributed to pre-silicon verification of IP utilizing SystemVerilog and UVM, ensuring comprehensive coverage.
- Completed UVM Synopsys lab in SystemVerilog, enhancing ASIC design validation & testbench development.
- Implemented Crontab job for weekly lint regression, eliminating manual checks and speeding up report delivery by 50%, enabling faster iterative development for the entire team.

### Information Technology Intern

May 2023 – Aug. 2023

Envionics Analytics

Toronto, ON

- Spearheaded donation of 30+ laptops, gaining expertise in computer software architecture, including BIOS, OS, and drivers, while ensuring data integrity via secure boot and UEFI, showcasing hardware diagnostics.
- Resolved firmware incompatibility for 150+ internal phones using IPv4, achieving annual cost savings of \$5,000.
- Automated inventory cost allocation with a Python script for over 300 assets, improving efficiency by 40%.

## PROJECTS

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

- Constructed a 32-bit 3-stage pipeline RISC CPU using VHDL on an Altera DE2-115 FPGA board with Intel Quartus II for synthesis and simulation, achieving a target frequency of >50MHz.
- Designed and simulated a register set, program counter, ALU, data path, and control unit, leveraging instruction set architecture, register transfer, and control hardware, achieving efficient RISC processing.

### Ray Tracing Application | C, C++, ImGui, Visual Studio, Walnut Framework

- Built a ray tracing app in C++, optimizing the Renderer class and multi-threading to cut render times by 30%.
- Deployed an interactive ImGui UI for real-time adjustments integrating the Walnut framework in Visual Studio while assessing GPU & gaming acceleration techniques for potential CUDA implementation to enhance performance.

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

- Engineered a Bluetooth-controlled RC robot car using Arduino, enabling remote control from smart devices and achieving seamless communication and control.
- Integrated obstacle detection in robot, achieving a detection range of 0.2 meters and enhancing safety features.

### General Purpose ALU Implementation | VHDL, Quartus II, Cyclone-IV EP4CE115F29C7

- Developed an 8-bit ALU with control unit, FSM, and decoder in VHDL, simulated using Quartus II, and deployed on a Cyclone-IV FPGA to perform various arithmetic and logical operations displaying results on 7-segment displays.

### Helicopter Prison Escapes | Python, Jupyter Notebook, Wiki API, SQL

- Analyzed 30 years of prison escape data using Python, creating dynamic visualizations that revealed a 10% increase in successful escapes over time while improving Python algorithmic proficiency with nested loops and conditionals.

Open to relocation.

Canadian Citizen.