Caleb Joseph

(647) 335-9945 | caleb.joseph@torontomu.ca | calebjoseph28.netlify.app | linkedin.com/in/Calebj28 | github.com/Calebj28

Education

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

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

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

Technical Skills

Languages: Python, Java, C/C++, VHDL, SystemVerilog, Verilog, TCL, Perl, Bash/CSH
Technologies: Arduino, Multisim, Simulink, Intel Quartus II, ASIC/FPGA, RTL, UVM, VCS, Verdi, Linux, UNIX, MATLAB
Frameworks, Dev. Tools & Libraries: React, Node.js, JUnit, Git, VS Code, Visual Studio, NumPy, Matplotlib, JSON
Other: Verification, Validation, Debugging, Scripting, CMOS, Digital Systems, VLSI Design, Digital Design, Test Coverage

Experience

Video Domain Engineer Intern 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%.
- Orchestrated a full-stack solution using React, Node.js, Python, JSON and ThreadPoolExecutor, enhancing software security with CodeQL for Code Scanning AI Hackathon, improving vulnerability detection by 30% within Git.
- Streamlined frontend development with GitHub Copilot, enhancing UI creation, code generation, refactoring, and real-time error detection, resulting in a 50% increase in development speed.
- Attained Bash, Perl and TCL scripting experience to improve design release flows, enhancing process automation.
- Pursuing certification in SystemVerilog, UVM and Verdi through Synopsys course enhancing ASIC design expertise.
- Collaborated with SoC design teams on developing new tooling and enhancing current tool functionality.

Information Technology Intern May 2023 – Aug. 2023

Environics 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.
- Designed and built a Bluetooth-controlled RC robot car using Arduino, implementing advanced motor control algorithms for precise movements and achieving an obstacle detection range of 0.2 meters.

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

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