

Youssef Elhagrasy

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EDUCATION

Bachelors of Applied Science - Engineering Physics - University of British Columbia Vancouver, Canada
Specialization in Electrical/Computer Engineering, Dean's Honour List May 2027

EXPERIENCE

Microsoft: Silicon Engineering Intern Summer 2025
Microsoft Austin, Texas

- Chip Characterization & data analysis of V-F characteristics and power performance on Azure Hardware Systems & Infrastructure Team
- Designed and implemented a **retrieval-augmented AI agent system** capable of context-aware code generation, execution, and iterative reasoning, leveraging vector search, knowledge graphs, and LangGraph for tool orchestration and planning.

UBC: Undergraduate Researcher - Digital Design Intern Feb 2023 – present
University of British Columbia Vancouver, Canada

- Developed an IEEE 1500 **DFT** (Design-For-Test) Compliant block for IP developed by the lab, adding scan path capability
- Validated results using a smokescreen testbench and working on implementing **UVM**
- Writing a literature review on reliability and wear-out methodologies of IC including electromigration.
- Collaborated with Prof. Andre Ivanov and Ian Hill to author the literature review for publication.

Microchip: Product Engineer Co-op January 2024 – April 2024
Microchip Burnaby, Canada

- Created Python test scripts to test TX jitter across a family of chips and their firmware.
- Tested and verified the internal interference for SERDES PCIe 5 chips using a Signal Source Analyzer (SSA).
- Experimented and reported TX jitter measurements using an 80 GHz oscilloscope.
- Measured VCO-coupling based on architecture across a family of chips for mixed-signal design.

TRIUMF: Firmware & Simulation Intern and Researcher May 2023 – August 2023
TRIUMF Vancouver, Canada

- Utilized **C++** programming language on a **Linux** system to design and optimize **simulation** code for efficient and accurate computation of particle trajectories, energy deposition, and bubble formation.
- Collaborated with a team of researchers at TRIUMF, Snolab, and Fermilab to develop and implement simulation models for dark matter experiments using C++ and Geant4. This includes authoring a research paper together.
- Documented and simulated error sources for the Scintillating Bubble Chamber (SBC).
- Selected as one of three students from a pool of 2000+ applicants for this position.

PROJECTS

Optimized Serial Adder on VLSI & Layout | *Course, Cadence, Digital Design* September 2024 - December 2024

- Implemented the Finite State Machine from basic transistors and changed sizing to optimize for power and performance.
- Calculated & optimized sizing based on logical effort of logic gate to improve performance by about 140%.
- Reduced power consumption through critical path sizing & used **45 nm gpdk** technology for layout.

FPGA Machine Learning Acceleration | *Verilog, Vivado* July 2024-August 2024

- Implemented a pre-trained neural network in hardware to speed up inference by 300%.
- Wrote an AXI interface module to communicate neural network inputs & outputs between computer and FPGA.

Autonomous Self-driving Robot | *ROS, OpenCV, Python, Embedded Systems* September 2024 - December 2024

- Developed a ROS-based autonomous robot achieving a 95% success rate in navigating a 10m course.
- Implemented OpenCV algorithms to detect contours with 98% accuracy, ensuring precise waypoint detection.
- Optimized decision-making logic, reducing navigation errors by 40% and improving course completion time by 30%.

Robot Summer Competition Winners | *PCB Design, Firmware, C++* June 2024 - August 2024

- Designed power board PCB with current sense, H-bridges PCB, I/O Board, Sensor boards from scratch for ENPH Robot competition. Placed 1st out of 15 teams across cohort and featured on global news.

PUBLICATIONS

Research: Wafer-Scale Transfer of MXene Films with Enhanced Device Performance via 2D Liquid Intercalation - in Advanced Materials journal.

TECHNICAL SKILLS

Languages: C/C++, Linux, Python, Java, MatLab, LaTeX

Software Tools: NumPy, Pandas, TensorFlow, Linux, GitHub, Simulink

Electrical: ASIC, VLSI, Altium, KiCad, IC Design, FPGA, SystemVerilog, VHDL, Synopsis VCS, UVM, Cadence

AWARDS

Scholarships: 2x Faculty of Applied Science International Student of the Year, 2x Dean's Honor's List, International Major Entrance Scholarship, Outstanding International Student Scholarship

Research: Eric Vogt First Year Summer Research Experience Scholar, Saudi Research Science Institute Top Student Award & Top Presenter Award