

# Aryan Karnati

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## Education

### McMaster University

September 2023 - April 2027

Bachelors of Electrical Engineering Co-op

Hamilton, ON

- Coursework: Logic Design, Microprocessor Systems, Circuits and Systems, Data Structures and Algorithms

## Skills

**Languages and HDLs:** C, C++, Python, Verilog, SystemVerilog, VHDL

**EDA and Simulation Tools:** Keil, STM32CubeIDE, Altera Quartus, ModelSim, SymbiYosys, MATLAB, Altium, LTSpice

**Design and Development Concepts:** UVM, Bare-metal programming, RTOS, RTL Design, Embedded Driver Design

## Relevant Experience

### Quality Management Intern

May 2025 - Present

Mackenzie Investments

Toronto, ON

- Expected to support process validation and issue tracking by analyzing workflow data using tools such as Excel and Power BI, with the goal of identifying trends and recommending process improvements
- Anticipated to assist in managing version-controlled documentation to ensure compliance and traceability across internal systems
- Will collaborate with cross-functional teams to develop automated dashboards and reporting tools for real-time performance monitoring and continuous improvement initiatives

### High Voltage Circuit Designer

September 2024 - Present

McMaster Formula Electric

Hamilton, ON

- Designed and simulated the Insulation Monitoring Device (IMD) Test Board using Altium Designer and LTSpice, ensuring safe operation of the high-voltage battery system up to 500V
- Conducted functional validation and fault diagnostics on high-voltage subsystems using oscilloscopes and multimeters, identifying and resolving over 15 critical electrical issues during integration

## Projects

### Spatial Mapping LiDAR System

January 2025 - April 2025

- Designed and implemented a 360° indoor LIDAR mapping system using the MSP-EXP432E401Y microcontroller, VL53L1X ToF sensor, and 28BYJ-48 stepper motor
- Developed custom C firmware in Keil uVision to control motor rotation, trigger I2C-based distance sensing, and transmit 3D scan data using polling-based state management and LED status indicators
- Integrated I2C and UART communication protocols with precise control over timing delays, polling logic, and memory management for efficient data acquisition and transfer
- Built a MATLAB script to convert UART ToF data into 3D Cartesian coordinates and visualize layered spatial maps

### BCD To Seven Segment Display Decoder

September 2024 - December 2024

- Designed and implemented a BCD to 7-segment decoder using Verilog in Intel Quartus, applying K-map optimization techniques to minimize logic gate usage
- Deployed the decoder onto an Intel MAX 10 FPGA, achieving responsive and real-time digital display output for practical embedded interface applications