

Dhyey Bhatt

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EDUCATION

University of Waterloo

BASc, Electrical Engineering

Waterloo, ON

Sep. 2024 – Present

- **CGPA:** 93.35%; **Relevant Courses:** Digital Logic, Electronic Circuits, Computer Architecture, E&M, DSA

TECHNICAL SKILLS

Programming: Python, C/C++, Java, Git, Linux, NodeJS, React, MATLAB, OpenCV, PyTorch

Design Tools: KiCad, Altium, SPICE, CubeMX, Vivado, Quartus Prime, COMSOL, SolidWorks

Embedded & Digital: STM32, ESP32, Arduino; VHDL, Verilog, RISC-V; I2C, SPI, UART, CAN; FreeRTOS, ROS2

Prototyping & Testing: Soldering, Oscilloscope, Multimeter, Logic Analyzer, 3D Printing, Power Tools

EXPERIENCE

Hardware Engineering Intern

AlumaPower Corporation

Sep. 2025 – Dec. 2025

Sarnia, ON

- Designed a 6-layer **STM32**-based PCB in **KiCad** for telemetry collection and actuator control supporting thermal management and hydrogen monitoring systems, updating the board architecture and reducing PCB area by **20%**
- Implemented power and signal conditioning using voltage regulators, op-amps, low-pass filters, and soft-starts
- Designed circuit schematics and **PCB layout** for custom interfacing breakout boards, including hydrogen sensor and ST-Link debugger boards, supporting sensor integration, board bring-up, and more efficient system validation
- Wrote and tested embedded C firmware using **CubeMX** and STM32CubeIDE to validate ADCs, timers, and communication interfaces including SPI, I2C, UART, and Ethernet during prototyping and component selection
- Performed hardware prototyping and system-level testing through soldering and rework, **SPICE** simulations, actuator power performance testing, and waveform verification using an **oscilloscope** and a multimeter

Energy and Water Specialist Intern

Exergy Associates Ltd.

Jan. 2025 – Apr. 2025

Burlington, ON

- Built a web app for site audit data collection using Node.js, Express, and JSON, streamlining note-taking and data processing by generating CSV files with columns matched to custom Excel tables, saving up to **2 hours** per audit
- Calculated energy and water usage models within 5% of actual bill data using building drawings, datasheets, RETScreen, Excel, and site audit findings to propose efficiency measures aimed at reducing consumption
- Developed a company website using React to enhance online presence and increase brand visibility

Electrical and Firmware Subteam Member

Midnight Sun Solar Race Car Team at the University of Waterloo

Sep. 2024 - Present

Waterloo, ON

- Designed PCBs in **Altium** for battery monitoring and power regulation using comparators with hysteresis and LDOs to detect voltage irregularities and support system power rails
- Developed STM32 interfaces using HAL and FreeRTOS for a radio module and ADC IC using UART and I2C
- Designed and simulated a PWM buck converter in LTSpice, implementing core regulator functions with a 555 timer and op-amp integrator to analyze DC-DC step-down performance

PROJECTS

FPGA Accelerated Handwritten Digit Recognizer Neural Network | [Code](#)

- Implemented a 3-layer neural network from scratch in Python using NumPy, coding backpropagation and gradient descent and achieving **92%** accuracy on the MNIST dataset
- Used ReLU and Softmax activations with cross-entropy loss to support stable training & multi-class classification
- Deploying a **quantized int8/int32** network on a Zynq-7000 SoC FPGA using **Verilog** and **Vivado**, creating an FSM-controlled custom UART IP to stream image data and perform parallel inference with real-time LED output

Electronic Etch-A-Sketch (Eink Drawing Device) | [Demonstration](#) | [Code](#)

- Designed a low-power STM32L433 PCB with an E-Ink display, coin-cell power using eFuses and charge pumps, I2C accelerometer for shake-to-erase input, and ADC-based potentiometer controls, targeting **60 hours** of operation
- Developed **custom driver** for the IT8951 E-Ink controller over SPI to support display updates and bring-up
- Currently fabricating the PCB and designing a compact 3D-printed enclosure in **SolidWorks**, accounting for mechanical constraints, mounting features, pin headers, and test points for system integration