

DWIJ JOSHI

Mechatronics Engineering Student · Embedded Systems · Software Testing & QA · Web Development
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PROFESSIONAL SUMMARY

Mechatronics Engineering student at Toronto Metropolitan University with demonstrated experience across embedded systems firmware, web development, and data-driven operations. Builds at the intersection of hardware and software — from FreeRTOS real-time systems and ADC sensor control loops to custom front-end applications with WebGL and vanilla JavaScript. Comfortable owning work end-to-end across both technical and cross-functional environments.

TECHNICAL SKILLS

Languages: C, C++, Python, Java, SQL, HTML, CSS, JavaScript

Embedded Systems: PWM control, ADC sensor integration, PMOS driver circuits, real-time feedback loops, UART/I2C/SPI

Web & Design: Vanilla JS, Three.js, WebGL, responsive layouts, UI component systems, performance optimization

Tools & Platforms: Git, Arduino IDE, PlatformIO, Tinkercad, MATLAB, VS Code, Make, FreeRTOS

Testing & QA: Test case design, black-box & white-box testing, defect tracking, validation & verification

ENGINEERING PROJECTS

RTOS Task Scheduler | C11 · FreeRTOS · Queue · Semaphore · Mutex · POSIX

- Implemented a three-task FreeRTOS system (SensorTask, ControlTask, DisplayTask) with priority-based scheduling; inter-task communication via typed queue, binary semaphore for critical-temp alerting, and mutex for shared resource protection.
- Built a POSIX simulation layer mapping the full FreeRTOS API to pthreads, enabling host-machine testing with code identical to STM32 hardware deployment; porting requires changing three HAL function calls only.
- Validated threshold decision logic independently in a standalone C unit before hardware integration. Repo: github.com/dwijjoshi14/rtos-task-scheduler

Embedded Heat Management System | C++ · Arduino · PWM · TMP36 · NeoPixel · Tinkercad

- Built closed-loop thermal control on Arduino Uno: TMP36 ADC sensing, threshold-based PWM fan control via PMOS high-side driver; identified and resolved inverted PWM logic error (255 – fanSpeed correction).
- Delivered synchronized multi-output feedback: 16x2 LCD (live temp + fan %), 80-LED NeoPixel (color-coded thermal zones), PWM-controlled cooling fan. Simulated and debugged in Tinkercad Circuits.

DC Circuit Analyzer | C++17 · OOP · KVL/KCL · Ohm's Law · Make

- Solo C++17 command-line tool applying Ohm's Law and Kirchhoff's Laws to series and parallel DC resistive circuits; computes total resistance, branch currents, voltage drops, power, with automatic KVL/KCL self-verification.

WORK EXPERIENCE

Web Designer | **Can Crops Inc.** — North York, ON

May 2026 – Jul 2026

- Built and launched a fully responsive 6-page website from scratch for an early-stage agri-tech startup, establishing the company's first professional web presence with a complete brand identity system (typography, color palette, icon set, UI components).
- Produced 30+ branded digital assets across web and social media including banners, post templates, and interactive elements; cut future asset production time by ~40% through a reusable component library.
- Optimized front-end performance through image compression, lazy loading, and CSS/JS cleanup, reducing estimated page load time by ~30% across desktop and mobile.
- Optimized front-end content and asset performance; ensured cross-platform visual consistency across web and social media touchpoints.

Intake Worker | **Settlement Assistance & Family Support Services (SAFSS)** — Toronto, ON

May 2026 – Jul 2026

- Managed end-to-end client intake and data entry for 30+ weekly cases with zero database integrity errors; maintained confidential records for 150+ active client files in a regulated social services environment.
- Generated weekly participation reports consolidating data across 4 service streams; designed a standardized intake checklist that reduced average onboarding time by ~20%.

Administrative Assistant | **Rosalie Hall Mental Health Institution** — Toronto, ON

Jul 2024 – Aug 2025

- Rebuilt Excel-based client tracking for 50+ users, cutting report generation from ~3 hours to under 45 minutes; designed a data-entry protocol adopted across 3 program teams improving audit readiness.
- Produced monthly outcome dashboards for clinical leadership translating raw data into actionable summaries informing staffing and resource decisions.

Senior Program Assistant | **Leacock Foundation** — Toronto, ON

Feb 2023 – Oct 2025

- Identified a 15% attendance drop-off across 100+ students through data review; flagged it to leadership — resulting schedule change recovered participation within 6 weeks. Certificate of Recognition awarded.

EDUCATION

Bachelor of Engineering — Mechatronics Engineering · Toronto Metropolitan University · Expected: April 2029

Relevant Coursework: Embedded Systems, Data Structures & Algorithms, Digital Logic, Circuit Analysis, OOP, Discrete Mathematics, Engineering Communication