

JUSTIN MULHALL

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EDUCATION

Ivey Business School + University of Western Ontario

London, ON

Combined BESC in Mechatronic Systems Engineering with Ivey HBA – 88%

Sep. 2024 - Present

- Relevant Coursework: Circuits & Systems (100%), Mechanics of Materials (94%), Electric Circuits (92%), Thermodynamics (92%), Electrical Instrumentation (91%), Dynamics (88%), Fluid Mechanics & Heat Transfer (86%).
- Awards: Dean's Honor List (2024/25, 2025/26), Western Scholarship of Distinction (2024).

TECHNICAL PROJECTS

Gordo – Autonomous Quadruped Robot

Personal Project

Full-Stack Design: CAD, Electronics, Firmware

May 2026 - Aug. 2026

- Designed and built an 8-DOF walking robot end to end: ESP32-S3 driving eight DS3218 servos through a PCA9685 PWM controller over I2C, powered by a 3S LiPo with regulated logic and actuator rails.
- Modeled every structural component in CAD and 3D printed them, iterating leg geometry, servo horn interfaces, and joint tolerances to eliminate backlash at the hip and knee.
- Built the power distribution and signal schematic, then soldered the wiring harness, validating rail voltages and stall current draw before first power-on.
- Wrote the gait firmware in C++, implementing leg inverse kinematics and a phase-offset trot gait; version-controlled and documented on GitHub.

Client-Based Seeder Design Project

London, ON

CAD & Prototyping Lead

Jan. 2025 - Mar. 2025

- Translated client objectives into quantified engineering requirements traceable to their KPIs, driving concept selection through a weighted decision matrix.
- Modeled the assembly in CAD for manufacture, bench-tested prototypes for seed metering consistency, and placed first in the Seeder Design category.

Automated Eraser Sorting System

London, ON

Systems Design Project

Jan. 2026 - Apr. 2026

- Designed a closed-loop sorting machine that classified erasers by colour and diverted them with a servo-actuated gate, integrating sensing, microcontroller logic, and actuation in one control loop.
- Prototyped the feed and diverter mechanism in CAD, soldered the sensor and actuator circuits, and debugged signal noise, tuning thresholds and timing to improve sorting accuracy.

PROFESSIONAL EXPERIENCE

Vancouver Airport Authority

Sea Island, BC

Data Analytics Co-Op, Smart Boarding Project

May 2026 - Aug. 2026

- Ran a systems analysis of gate boarding operations, collecting timestamped field data across 60+ flight audits and four airlines to characterize throughput against boarding sequence, aircraft configuration, and gate layout.
- Built throughput models in Excel and Power BI comparing traditional and biometric boarding, isolating bottlenecks and projecting a 15-30% reduction in boarding duration.
- Presented findings to airport and airline stakeholders to guide biometric boarding rollout and capital investment.

WV Lifeguarding and Lessons

West Vancouver, BC

Founder & Operator

May 2024 - Aug. 2026

- Grew summer revenue 10x (\$1k to \$10k) season over season through targeted marketing, restructured scheduling, and referral-driving client relationships.
- Scaled the client list from 6 to 45 while retaining clients year over year, testing pricing power by raising rates without measurable loss in demand.

Hollyburn Country Club Aquatics

West Vancouver, BC

Lifeguard Supervisor and Swim Instructor

Jun. 2023 - Nov. 2025

- Tested water chemistry for chlorine, pH, alkalinity, and calcium hardness, calculating and administering corrective dosing to hold parameters inside regulated ranges.
- Managed and supervised a team of up to 4 lifeguards at once, directing daily aquatic operations, and coordinating emergency first aid response.

ADDITIONAL INFORMATION

- **Software & Analysis:** Python, C++, Java, MATLAB, Git and GitHub, Excel modelling, Power BI, PowerPoint.
- **CAD & Manufacturing:** SolidWorks (CSWA certified), Onshape, GD&T fundamentals, design for manufacture, tolerance stack-up, FDM 3D printing.
- **Electronics & Embedded:** Soldering, wiring harness assembly, power distribution schematics, KiCad, ESP32 and Arduino, I2C/SPI/UART, PWM servo control, PID fundamentals.
- **Interests:** Hockey, triathlon, fly fishing, skiing, golf, self-directed investing, building robots, 3D printing.