Mekhail Brohi

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Education

Toronto Metropolitan University — Toronto, ON
Bachelor of Engineering in Electrical Engineering — *September 2026 – Expected 2031*

Dr. J.M. Denison Secondary School | *Ontario Secondary School Diploma, Semester 1 Average: 95%* — June 2026

- **Awards:** Two-Time Honour Roll, Technology Award, Science Award, Geography Award, and Learning Skills/Leadership Award

Technical Skills

Programming: Python, C++, Arduino programming, microcontroller control logic, PWM
Embedded Systems: ESP32, Arduino, Bluetooth, Wi-Fi, motor drivers, sensors, servo motors, DC motors
Design & Manufacturing: Fusion 360, AutoCAD, CAD modelling, polymer additive manufacturing (FDM 3D printing), mechanical assembly
Electronics: Breadboarding, soldering, circuit prototyping, MOSFETs, diodes, resistors, fuses, power distribution, voltage management
Software & Tools: Microsoft Excel, Arduino IDE, Git, GitHub, multimeter, soldering iron, crimping and wiring tools

Engineering Projects

ESP32-Based RC Car | *ESP32, L298N, DC Motors, Bluetooth* — December 2025

- Designed and built a four-wheel RC car controlled wirelessly through a PS4 controller and ESP32 microcontroller.
- Interfaced four TT gear motors with an L298N motor driver and programmed directional motor-control logic.
- Constructed a reinforced ladder-frame-inspired chassis and separated motor and controller power systems to improve reliability.

Alexa-Enabled Automated Light Switch | *ESP32, Servos, MOSFET, Wi-Fi* — February 2026

- Built a voice-controlled mechanism using two servo motors to operate a household light switch through Alexa commands.
- Integrated an IRLZ44N MOSFET circuit to disconnect servo power while idle and reduce battery consumption.
- Added gate-series and pulldown resistors to reduce switching noise and prevent unintended activation during startup.

Workbench Power Supply | *ATX PSU, Soldering, Circuit Protection* — January 2026

- Repurposed a 430 W ATX computer power supply into a workbench unit with accessible 3.3 V, 5 V, and 12 V DC outputs.
- Installed terminal blocks, banana posts, inline fuses, switches, LED indicators, and a dummy-load resistor for safe power distribution.
- Designed and assembled a custom enclosure with an organized front interface and securely routed internal wiring.

Three-Phase Brushless Motor Prototype | *Arduino, PWM, Electromagnetism, MOSFET* — March 2026

- Constructed a brushless motor prototype using hand-wound copper coils, permanent magnets, a custom rotor, shaft, and bearing supports.
- Developed an Arduino-based PWM control circuit using a potentiometer, MOSFET, and protective diodes.
- Troubleshot coil arrangement, rotor alignment, electromagnetic switching, and mechanical stability during testing.

Leadership & Community

Robotics Team Lead Member — Newmarket, ON
York Region Skills Challenge Team — *2025 – 2026*

- Supported robot development, technical problem-solving, task coordination, and team preparation for the York Region Skills Challenge.

Peer Tutor — Newmarket, ON
Mathematics and Science — *2022 – 2026*

- Tutored classmates by adapting explanations, preparing practice problems, and applying active-learning techniques.

Volunteer Lawn-Care Provider — Newmarket, ON
Community Service — *2022 – 2026*

- Provided reliable lawn mowing and gardening assistance to elderly residents who had difficulty completing yard work independently.