

Manveer Aujla

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EDUCATION

M.Sc. in Electrical and Computer Engineering Sep. 2025 – Present
University of Manitoba Winnipeg, Canada

CGPA: 4.50/4.50

- Thesis: “A Transformerless Integrated Onboard Charger for Two-Battery Dual-Inverter EV Powertrains”
- Researching power converter design and control for electric vehicles with Magna International Inc.
- First author of three IEEE conference papers, including one awarded Best Student Paper
- Led a patent application, collaborated on a second, and currently contributing to two others (to be filed)

B.A.Sc. in Electrical Engineering (Honours, Co-op) Sep. 2021 – Aug. 2025
University of Windsor Windsor, Canada

CGPA: 95.33/100 | **Minor:** Mathematics

PUBLICATIONS

Submitted Journal Extended Abstracts

- [J2] **M. Aujla**, G. Feher, and C. Viana, “Grid-Weakening Control for Operating-Range Extension of Grid-Connected Cascaded H-Bridge Converters,” in *IEEE Transactions on Industry Applications*, Sep. 2026 (**Submitted**).
- [J1] G. Feher, **M. Aujla**, and C. Viana, “Carrier Phase-Shift Controlled Auxiliary DC Power Transfer in a Grid-Connected Cascaded H-Bridge Converter,” in *IEEE Transactions on Industry Applications*, Sep. 2026 (**Submitted**).

Peer-Reviewed Conference Publications

- [C3] **M. Aujla**, G. Feher, and C. Viana, “A Modulation Strategy for Bidirectional Integrated Onboard and Wireless EV Charging,” *2026 IEEE Energy Conversion Congress and Expo (ECCE)*, Vancouver, Canada, Oct. 2026 (**In press**).
- [C2] **M. Aujla**, P. Lewoc, H. S. Toor, A. Ali, C. Viana, and N. C. Kar, “Improved Single-Input Space Vector for DC-Biased Sinusoidal Current Control in Battery Cyclers,” *2026 IEEE Energy Conversion Congress and Expo (ECCE)*, Vancouver, Canada, Oct. 2026 (**In press**).
- [C1] **M. Aujla**, G. Feher, and C. Viana, “Real-Time Hands-on Tool for Teaching Three-Phase Motor Control,” *2026 IEEE Global Engineering Education Conference (EDUCON)*, Cairo, Egypt, Apr. 2026, doi: [10.1109/EDUCON67543.2026.11574274](https://doi.org/10.1109/EDUCON67543.2026.11574274) (**Best Student Paper**).

Patent Applications

- [P2] H. S. Toor, I. Amezyane, G. Feher, **M. Aujla**, L. V. Iyer, C. Viana, N. C. Kar, and A. Anik, “Dual Inverter Integrated Multilevel Drive System,” U.S. Provisional Patent Application, No. 64/086,081, Jun. 2026.
- [P1] **M. Aujla**, G. Feher, H. S. Toor, L. V. Iyer, N. C. Kar, C. Viana, and A. Anik, “Coupled-Inductor-Based Modular Drivetrain,” U.S. Provisional Patent Application, No. 64/083,530, Jun. 2026.

HONOURS & AWARDS

Canada Graduate Research Scholarship – Master’s (CGRS-M) 2026

Natural Sciences and Engineering Research Council of Canada (NSERC)

Best Student Paper Award, IEEE Global Engineering Education Conference (EDUCON) 2026

Master’s Studentship Award, Research Manitoba (declined in favour of CGRS-M) 2026

BERVIN Fellowship in Engineering , University of Manitoba	2026
Engineering Class of 1946 Graduate Scholarship , University of Manitoba	2026
Ten Undergraduate Scholarships , University of Windsor	2021 – 2025

Ontario Professional Engineers Foundation for Education Undergraduate Scholarship (2024, 2025), Alumni In-Course Scholarship (2025), Sceptre Investment Counsel Limited Scholarship (2025), Liburdi Engineering Mentorship Award (2024), Windsor-Essex County Engineering Month Award (2024), WINONE Tutorial Award (2023), Carlo and Domenica Liburdi Memorial Award (2021), Outstanding Scholars Entrance Scholarship (2021), President's Renewable Entrance Scholarship (2021)

RESEARCH & TEACHING EXPERIENCE

Teaching Assistant University of Manitoba	Sep. 2025 – Present Winnipeg, Canada
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- ECE 4150: Control Systems (F2025, W2026, F2026)

Undergraduate Research Assistant University of Windsor – CHARGE Lab	Sep. 2023 – Aug. 2025 Windsor, Canada
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- Assisted with the design, simulation, and fabrication of a 100 W, 25 kHz active-isolated buck-boost converter (30 V to 10–75 V) for EV applications using Simulink and KiCad

Lead WINONE Tutorial Scholar University of Windsor	May 2024 – Apr. 2025 Windsor, Canada
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- Led a \$40,000 tutoring program with faculty by managing, scheduling, and training tutors
- Hosted tutorial sessions and exam reviews for first- and second-year engineering students

Teaching Assistant University of Windsor	Jan. 2023 – Dec. 2023 Windsor, Canada
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- GENG 1201: Cornerstone Design (W2023); GENG 8000: Technical Communications (F2023)

Undergraduate Research Assistant University of Windsor – e-Minds Lab	Sep. 2022 – Aug. 2023 Windsor, Canada
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- Characterized baseline responses of electrochemical sensors using a Keysight E4990A impedance analyzer to validate designs for industry use
- Assisted with circuit design and PCB layout for environmental sensor systems using Autodesk EAGLE

Undergraduate Research Assistant University of Windsor – Human Systems Lab	Jan. 2022 – Aug. 2022 Windsor, Canada
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- Processed and analyzed eye-tracking data for a cognitive load study in autonomous driving

INDUSTRY EXPERIENCE

Hardware Developer Co-op Nokia	Sep. 2024 – Dec. 2024 Ottawa, Canada
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- Brought up and tested PCBs using embedded Linux, including firmware upgrades and PRBS testing
- Automated bring-up, testing, and log parsing with Bash and Perl scripts
- Debugged PCBs using Cadence layouts and Tektronix oscilloscopes, and reworked them by soldering

Controls Co-op Ford Motor Company	Jan. 2024 – Apr. 2024 Windsor, Canada
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- Programmed Siemens PLCs and HMIs in TIA Portal to improve station logic and operator interfaces
- Built a MATLAB tool to automate cycle-time analysis and used it to optimize the assembly process
- Developed a panel heat-dissipation calculation procedure adopted by engineers and technicians

Battery State Estimation Co-op

Stellantis – Automotive Research and Development Centre

Apr. 2023 – Aug. 2023

Windsor, Canada

- Developed software to characterize battery state-of-power violations, adopted by the engineering team
- Processed pack data in MATLAB to validate battery models and state-estimation algorithms
- Automated existing MATLAB post-processing scripts and extended them with additional outputs

PROJECTS

Hardware-in-the-Loop Simulation of PMSM Speed Control in an EV Drive

github.com/ManveerA/EV_Speed_Control_RTBox

Sep. 2025 – Dec. 2025

Winnipeg, Canada

- Designed field-oriented control (FOC) of a PMSM EV drive and validated it in hardware-in-the-loop (HIL) simulation
- Modelled the real-time EV plant on a PLECS RTBox 1 and programmed the digital controls on a TI LaunchPad F28379D

Interactive Real-Time Visualization of a Controlled BLDC Motor

github.com/ManveerA/Motor-FOC-Visualization-Tool

Jan. 2025 – Aug. 2025

Windsor, Canada

- Led the design of a real-time tool that teaches electromechanical relationships in a three-phase BLDC motor under user-driven field-oriented speed control (published as [C1])
- Designed and fabricated a custom PCB that senses and filters voltage, current, Hall, and encoder signals, interfacing a TI LaunchPad F28379D and a Raspberry Pi

DC/DC Buck Converter PCB

github.com/ManveerA/Buck_Converter_PCB

Jan. 2025 – Apr. 2025

Windsor, Canada

- Designed, fabricated, and tested a 36–50 V to 30 V buck converter PCB to meet ripple specifications
- Implemented digital control designed by emulation on a TI LaunchPad F28379D

LEADERSHIP & SERVICE

Academic Administrative Unit Student Representative

University of Windsor – Department of Electrical and Computer Engineering

Sep. 2021 – Aug. 2025

Windsor, Canada

- Shaped curriculum on the departmental council and evaluated tenure-track and sessional hires

Volunteer Youth Soccer Coach

Windsor Sports and Culture Centre

Jun. 2019 – Aug. 2025

Windsor, Canada

- Coached players aged 12 and under each summer, building confidence, discipline, and teamwork

Academic and Sustainability Commissioner

University of Windsor – Engineering Society

Jul. 2022 – Dec. 2023

Windsor, Canada

- Devised and led the annual engineering senior design competition, themed on EV battery enclosures, in collaboration with the Dean, an industry sponsor, and peers

Outstanding Scholars Peer Mentor

University of Windsor

Sep. 2022 – Aug. 2023

Windsor, Canada

- Mentored first-year engineering students in balancing academics and extracurricular activities

Volunteer Engineering Tutor

University of Windsor – Faculty of Engineering

Sep. 2021 – Aug. 2023

Windsor, Canada

- Tutored senior-year high school students in university-preparation mathematics, physics, and chemistry courses