Louis Nguyen

2 Place d'Alsace, Kirkland, Quebec H9H 5J8
514-980-1576 louiscars170@gmail.com linkedin.com/in/LouisNguyen16 github.com/louiscars190

Education

Concordia University **September 2024 – May 2028 (expected)**
Mechanical Engineering *Montreal, Quebec*

- **Cumulative GPA: 4.10/4.30**

Relevant Experience

GLV Electrical Harness Lead **January 2025 - January 2026**
Concordia Formula Racing (Formula SAE) *Montreal, Quebec*

- Co-designing 2026 accumulator with 2 other members using tabless high-energy-density 21700 cylindrical cells, resulting in a more compact pack footprint via thermal and mechanical simulation-driven optimization; redesigned architecture supports a higher system voltage for improved power delivery.
- Evaluated cell layout, fuse topology, segment configuration, and busbar locations, incorporating active cooling (fan placement and airflow direction) and thermally optimized segment sizing and placement to mitigate thermal propagation risk and keep cells in optimal working temperature range. Optimized the design to meet FSAE electrical and safety regulations while minimizing pack weight and volume.
- Led the design and fabrication of the full low-voltage wiring harness using Altium Designer, including schematic layout, pinout mapping, and selection of water-resistant connectors for a dynamic competition environment; completed full harness build on a custom formboard, integrating shutdown circuit wiring, standardized color-coding for signal and power lines, and proper strain relief for long-term durability.
- Designed and implemented the CAN network architecture, utilizing shielded twisted-pair wiring, three-position split connectors to maintain proper bus topology, and a centralized star-point grounding strategy to ensure signal integrity and eliminate ground loops across the vehicle's grounded low voltage system.
- Designed, manufactured, and integrated waterproof PCB enclosures for critical custom PCBs and configured an ECUMaster ADU5 steering wheel display to provide the driver with real-time vehicle status, safety alerts, and sensor data, while enabling data logging for post-run analysis and subsystem data acquisition.
- Performed sensor bring-up and BMS firmware debugging for STM32F105 MCU running FreeRTOS, validating live data over CAN using tools like SavvyCAN and ECUMaster Data Master; ensuring accurate voltage tap reporting and accurately-mapped sensor data

Research

McGill Laboratory of Craniofacial Tissue Engineering and Stem Cells **June 2024 – Present**
Research Assistant *Montreal, Quebec*

- Co-authored publications exploring hydrogel mechanics, real-world implementations of hydrogels in Biosensors and bio-ink formulations for salivary gland regeneration
- Grew and passaged mesenchymal stem cells, and performed quantitative analysis of cell proliferation using WST-8 assays and confocal microscopy with advanced immunofluorescent staining techniques under varying experimental conditions. Captured and interpreted SEM images for pore size data, leading to the discovery of optimal soy concentration to maximize hydrogel porosity and cell viability.

Personal Technical Projects

Hand Dual-Clutch Paddles for Formula Wheel **September 2024**
C++, ESP-IDF, ESP32 Microcontroller, PrusaSlicer

- Designed and built a wireless hand clutch system for a Fanatec Formula wheel using an ESP32 microcontroller with hall effect sensor input and Bluetooth transmission; collaborated on firmware and 3D-printed the clutch housing and paddle assembly

Skills

Modelling Software: Fusion 360, AutoCAD, Solidworks
Programming & Embedded Systems: C/C++, Python, Embedded Systems (STM32, FreeRTOS, UDS, SPI, UART), Bluetooth Low Energy
Vehicle Systems & Diagnostics Suite: SavvyCAN, Linux, MoTeC I2 Pro, ECUMaster Data Master, Altium Designer
Fabrication Skillset: CNC (Lathe & Mill), FDM 3D Printing, Crimping, Soldering, PCB Manufacturing