LIAM FRIJA-ALTARAC

Montreal, QC
liam.frija-altarac.1@ens.etsmtl.ca | linkedin.com/in/liamaltarac

EDUCATION

Master of Computer Science, École de technologie supérieure (ÉTS) 2022 - 2025
Machine Learning and Computer Vision

- Analyzing the propagation dynamics of convolutional filters through symmetry and spectral decomposition.
- Investigating geometric and spectral patterns that emerge in CNN kernels trained on large-scale datasets.
- Developing a mechanistic interpretability framework to better understand how information propagates through CNN layers (in pixel space).

Bachelor of Electrical Engineering, École de technologie supérieure (ÉTS) 2016 - 2020
Concentration in Computer Science

DEC in Computerized Systems Technology, Vanier College 2013 - 2016

SKILLS

Technical	Machine Learning, Computer Vision, Image Processing
Software	Python, NumPy, PyTorch, TensorFlow, Keras, Qt, Matlab, C

EXPERIENCE

Machine Learning / Computer Vision Developer May 2025 - Jan 2026
Little Angel Medical *Montreal, QC*

- Assisted the Research and Development team in building machine-learning solutions for pediatric monitoring tools.
- Designed and implemented models using modern learning-based techniques (VLMs, contrastive learning approaches)

Laboratory Instructor (SYS818, SYS809) Sep 2024 - Dec 2025
École de technologie supérieure (ÉTS) *Montreal, QC*

- Assisted students in graduate-level courses in Computer Vision, Machine Learning and medical imaging.
- Helped students understand key concepts, debug implementations, and apply theoretical knowledge to practical projects.

Software Developer Feb 2021 - Jan 2022
Belden Inc. *Montreal, QC*

- Programmed various tools (using Python, NumPy, Qt) to assist with the Research and Development team.
- Wrote software to analyse copper as well as fiber optic components.
- Developed a reference/dependency tool with text analysis for internal file management.

Firmware Development Intern May 2019 - Aug 2019
CAE Healthcare *Montreal, QC*

- Developed firmware in C for STM32F4 microcontrollers.
- Worked with communication protocols such as SPI, I^2C, and DMA.
- Programmed real-time systems.

Automated Test System Development Intern Sept 2017 - June 2018
Belden Inc. *Montreal, QC*

- Programmed software to analyse S-Parameters.
- Wrote software to establish communication with a Vectorial Network Analyzer to acquire data remotely.
- Developed a graphical interface in Python to display acquired and calculated data.

- Developed circuits and software to facilitate testing and automate report generation.

PROJECTS

Semi-Autonomous Car. Programmed an STM32F0 (ARM Cortex-M0) for a semi-autonomous car that could be controlled by remote control, as well as avoid obstacles. Implemented USART and I^2C from scratch, I/O control (motors, sensors, etc.), and collision avoidance logic.

Neural Network with Backpropagation. Wrote a Neural Network (MLP) library from scratch using Python and NumPy, to obtain a deeper understanding of Backpropagation. Developed a web interface in Bootstrap and Flask to interface with the library to easily train and configure a custom MLP.

Race Horse Biometric System. Built a real-time biometric system that would be used for race horses to monitor their vital signs while racing. Programmed an Atmel microcontroller to interface with the various sensors. Developed a web interface (Bootstrap) to monitor the horse's condition.