ATHMANE BENAROUS

Montréal, QC | athmane.b02@gmail.com | Canadian citizen (TN-eligible)
linkedin.com/in/athmane-benarous | github.com/Otm02 | athmanebenarous.com

PROFILE

M.Sc. in Computer Science (Machine Learning) at McGill, graduating December 2026; B.Eng. in Software Engineering. I build and evaluate ML on real industrial data: high-voltage sensor time series, 600K+ materials, live production lines and LLM agents in daily use.

EDUCATION

McGill University, M.Sc. in Computer Science (Machine Learning) — Sep 2025 – Dec 2026
McGill University, B.Eng. Software Engineering, Co-op (Minor: Aerospace Engineering) — Sep 2021 – Aug 2025
Relevant coursework: Reinforcement Learning, Applied Machine Learning, Computer Vision, NLP, Intelligent Software Systems, Distributed Systems, Parallel Computing, Network Science, ML Applied to Climate Change

EXPERIENCE

Machine Learning Research Intern · Hydro-Québec Research Institute (IREQ), Varennes, QC — May 2026 – Sep 2026

- Built a detector for slow SF_6 loss in 145–315 kV circuit breakers from pressure and temperature records, where normal thermal swings (~40 mbar/°C) dwarf a 1%/year leak (~0.27 mbar/day).
- Designed a leakage-safe evaluation protocol for overlapping time-series windows: segment-grouped splits, invariance-screened features, healthy-only thresholds with exact Poisson bounds, and 7-day alarm confirmation.
- Selected an L1-regularized logistic regression over a temporal CNN: **0.867 vs 0.733** sensitivity against the physical baseline at an equal false-alarm budget on synthetic leaks; confirmed all 4 segments of the known leaking device.

Machine Learning Intern · Chemia Discovery, Montréal, QC — Feb 2026 – Aug 2026

- Designed and deployed Azure ML pipelines for training, evaluation and automated backfill inference of CGCNN property models across **600K+ materials**.
- Cut pipeline runtime from **30+ hours to under 1 hour** with parallel S3 fetching and batched API calls.
- Built the evaluation layer (held-out benchmarks, model cards, provenance scoring) and a React/NestJS training dashboard.

Software Developer · Russet House (food processing), Montréal, QC — Oct 2023 – Present

- Built a self-learning line-speed advisory on live SCADA data (recursive least squares, EWMA percentile bands, operator feedback), used by operators during shifts through a chat interface.
- Built and run LLM agents used daily over ERP, SharePoint and Teams data (multi-agent sales reporting, maintenance-document assistant, meeting follow-up); root-caused production failures (Graph API permissions, ID overflow, data corruption).
- Maintain Ignition SCADA, SQL Server and Power BI systems; integrated a wastewater flow meter (Modbus/OPC, SQL logging).

Machine Learning / Cybersecurity Intern · Hydro-Québec, Montréal, QC — May 2025 – Aug 2025

- Built an end-to-end NLP chatbot (naïve Bayes) that navigates a knowledge graph of criticality indicators; replaced email-chain approvals with a Power Apps / Power Automate / SharePoint workflow.

Earlier: Cybersecurity Intern, Hydro-Québec (2024): Python, Power BI and Power Automate reporting automation · CRM Developer Intern, Russet House (2023) · Business Intelligence Intern, CIUSSS Centre-Sud (2022)

RESEARCH & PAPERS

- **A Platform for the Semi-automatic Segmentation, Characteristic Shape Analysis and Simulation of Neuronal Somas** · Sep 2024 – Present. Vaa3D platform for 3D soma segmentation, shape analysis and synthetic training data; built the segmentation module (thresholding, median filtering, marker constraints) and its Dice evaluation.
- **AlphaGateau for Breakthrough: A piece of cake?** · May 2026. AlphaZero-style agents in JAX with Gumbel MCTS, comparing a graph-attention encoder to a CNN; 5×5 pretraining lifted early 8×8 win rate from 17% to 67%.
- **Energy Characterization of V-JEPA2** · Apr 2026. Per-phase GPU energy profiling of a ViT-Huge video model on a Slurm cluster; batch 1→2 gave +42% throughput and −27% energy per sample.
- **PolarBench: Multi-View Graph Construction and Benchmarking for Stance Detection in Decentralized Social Networks** · Apr 2026. Labeled and curated the gold-standard data and reviewed the final paper.
- **Optimizing Global River Flood Forecasting via Meta-Modeling** · Dec 2025. Predicting when fine-tuning global LSTM flood models pays off; leakage-safe regional splits.
- **Temporal Sentiment Analysis on Amazon Reviews** · Mar 2025. How the age of training data affects sentiment-model performance.

PROJECTS

- **BargainBot (McHacks 12)** · Jan 2025. AI agent that finds internet deals and negotiates for the user (Selenium, Cohere).
- **GreenFilter AI (Harvard AI EarthHack)** · Jan 2024. Layered LSTM model validating sustainability solutions; top 15%.

SKILLS AND OTHER

ML: PyTorch, JAX, scikit-learn, TensorFlow, NumPy, pandas; GNNs, time series and anomaly detection, RL (MCTS), LLM agents
Data & infrastructure: Azure ML, AWS S3, Slurm GPU clusters, SQL Server, PostgreSQL, MongoDB, Git
Software: Python, SQL, C, C++, Java, TypeScript, JavaScript, C#, Bash; React, Next.js, NestJS, Spring
Industrial: Ignition SCADA, Modbus/OPC, Power BI, Power Automate, Power Apps · Languages: French, English, Arabic
Other: Co-founder, DeepMonitor (vibration-sensing hardware for machine anomaly detection) · McGill Rocket Team (flight simulation)