

Sami Mostfa

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My Portfolio



Valid Canadian work permit for the entire internship (May 3 – August 31, 2027)

PROFILE

As a student in the **Professional Master's in Computer Engineering** at Polytechnique Montréal, I am looking for an internship in Montréal for the **summer 2027** term (May 3 to August 31, 2027), primarily in **Data Engineering**, **MLOps** or **ML Engineering**, while remaining open to other opportunities.

My dual training in software engineering (**ENSEEIHT**) and AI/ML (**Polytechnique Montréal**) has given me a solid foundation in both model design/training and infrastructure deployment. During my internship at *Axians HPC*, I contributed in particular to designing a **Kubernetes** architecture for integrating an **LLM** inference server. I now want to put this dual skill set to work on an end-to-end project, from design to production, in an **ML Engineer** or **MLOps Engineer** role.

EDUCATION

Polytechnique Montréal

08/2025 – 08/2027

Professional Master's in Computer Engineering - Montréal

- Current cumulative GPA: **3.83/4.0**
- Courses: Artificial Intelligence, Machine Learning, Continuous Optimization, Data Mining, Data Visualization, Bayesian Statistics, Natural Language Processing, Intelligent DevOps for Large-Scale Software Systems, Cybersecurity

ENSEEIHT

09/2023 – 06/2025

Software Engineering - Toulouse

- Courses: Software and Systems Engineering, Concurrent and Communicating Systems, Databases, Graph Theory, Automata Theory, Computability & Complexity, Computer Architecture, Object Technology, Networks, Formal Methods, Semantics & Language Translation

Preparatory Classes — Lycée Claude Fauriel

09/2021 – 07/2023

MPI / MP2I - Saint-Étienne*

- MPI*: Mathematics, Physics, Computer Science
- MP2I: Mathematics, Physics, Computer Science, Engineering Sciences

EXPERIENCE

High-Performance Computing Engineer Intern

06/2025 – 08/2025

Axians HPC (High Performance Computing)

Labège, France

- Designed an architecture integrating **Kubernetes** into the **Open OnDemand** (OOD) HPC portal, working around the adapter's native limitations; **solution put into production by Axians in 2026**
- Deployed and configured an **LLM inference server (vLLM)** on the Kubernetes cluster, to serve AI models to the platform's users
- Developed in **Bash** a *kubectrl* wrapper intercepting the adapter's calls and redirecting *get/delete* commands to the actual resources, making job status display on the web interface reliable
- Proposed **Kyverno** policies for automatic deletion of orphaned resources, quota management and access security (NFS mounts, GPU)
- Wrote the technical architecture document formalizing the OOD workflows (**Apache**, **NGINX**, **Passenger**, Kubernetes adapter), delivered to the client and the team
- Hard Skills: **Kubernetes**, **Model Deployment (vLLM)**, **Linux Systems**, **Bash**

Private Tutor in Mathematics & Computer Science ↗

09/2020 – 06/2025

Superprof — Self-employed

Toulouse, France (Hybrid)

- Private lessons in mathematics and computer science alongside my studies, given to about **15 high school students**, for a total of about **80 hours**
- Soft Skills: **Communication**, **Adaptability** to my audience, **Autonomy** in running an activity over several years

Lifeguard

07/2024 – 09/2024

Centre Aquatique Escap'ad

Saint Laurent de Chamousset, France

- Active supervision of the pools to ensure swimmers' safety & emergency response in case of accidents
- Soft Skills: **Taking responsibility, Decision-making** in critical situations

PROJECTS

Air Quality Prediction in Montréal in 2025 | Julia ↗

01/2026 – 04/2026

- **Team project (5 people)** graded **95/100** in the course **Probabilistic and Statistical Methods Applied to AI** (MTH3302), Winter 2026 term
- Prediction of fine particles at **7 stations** in Montréal from **17 years** of sensor data, about **33,000 samples**
- Data pipeline: handling of missing values depending on the variable (temporal interpolation, median imputation, removal), then engineering of more than **20 features** (lags, moving averages, weather interactions, seasonal and wildfire indicators)
- Comparison of **4 modeling strategies** (temporal weighting, per-station models, regime separation, **VIF/AIC** selection); best model chosen by **RMSE** minimization and submitted on **Kaggle**
- Hard Skills: **Time Series, Linear Regression, Feature Engineering**

Graph Clustering by Modularity Maximization | Julia ↗

07/2026 – Present

- Implementation of a scientific paper by Professor Daniel Aloise, who teaches **Data Mining** (INF8111) at Polytechnique Montréal
- Modularity optimization with several algorithms: **LPA, LPAm, LPAm+** (classic greedy and multi-step strategies) on 9 benchmark graphs from the DIMACS Implementation Challenge (from 34 to over 31,000 vertices)
- **Review of 5 scientific papers** to ground the implementation of the algorithms and validate the results
- Real-world applications: identifying affinity groups in **social networks**, financial **fraud detection**, better understanding of protein interactions in **biology**
- Hard Skills: **Data Science, Graph Theory, Applied Mathematics**

Basketball Detection and Localization with Deep Learning | Python

03/2025 – 05/2025

- **Team project (4 people)** for the deep learning course (N9EN19C) at ENSEEIHT
- Designed a **multi-output CNN (4 convolutional blocks, 32 to 256 filters)** combining **presence classification** and **bounding-box regression** to localize the ball
- **From-scratch** implementation of the **IoU** (Intersection over Union) metric, vectorized with **TensorFlow** tensors, as well as **Precision/Recall/F1-score** at a 40% overlap threshold
- Multi-task training over **25 epochs** (combined **BinaryCrossentropy** + **MSE** loss, **Adam** optimizer), with image normalization (**64x64px**) and standardization of box coordinates
- Real-world applications: **automated sports video analysis, real-time object tracking**
- Hard Skills: **Deep Learning, Computer Vision (CNN), TensorFlow/Keras**

TECHNICAL SKILLS

Languages: Python, Julia, C, Java, Typescript, Javascript, OCaml, Ada, Bash, HTML5, CSS3, Latex

Data Science: NumPy, Pandas, Scikit-Learn, Seaborn, XGBoost, DataFrames.jl, Distributions.jl, Statistics.jl

Data Visualization: D3.js, Matplotlib, Gadfly.jl, OpenGL

Machine Learning, AI & Deep Learning: PyTorch, TensorFlow, Keras, GLM.jl

Environments: VS Code, Vim, GCP, Google Colab, Eclipse, Jupyter Notebook

DevOps & Infrastructure: Kubernetes, Docker, NGINX, Apache, Kyverno, Ruby

Agentic AI: OpenRouter, MCP (Model Context Protocol), Claude Code, Prompt engineering, Development of custom skills & tools

Data Formats: SQL, CSV, JSON, Parquet, XML, YAML, XLSX, Markdown, Tex

Languages (spoken): French (Fluent), English (B2 – Cambridge Linguaskill Certification), Spanish (A2), Arabic (basic)

INTERESTS

Music: **14 years** of guitar practice & advanced knowledge of music theory — youtube.com/@sami.musiic ↗

First Aid: **400 hours** of cumulative training and practice — National Lifesaving and Water Rescue Certificate (8 months of training) & Team First Aid Level 1 (40h of training)

Guitar Lessons: **10 hours** of lessons taught, in addition to the private math and computer science tutoring

Sports: Swimming & Weightlifting