Arthur Maffre

📍 Montreal, QC | ✉ maffrearthur@gmail.com | 📞 (514) 501-7206 | 💼 arthur-maffre | ⌗ arthurmaffre

Highlights

- Designing intelligent systems for **dynamic pricing** and **portfolio** generation
- Research funded by **IVADO** at **Mila** (20k/year)
- Finalist at **McGill-FIAM Hackathon** | 3rd place at **Polytechnique Datathon**
- Bridging **AI theory** and real-world impact — from **GFlowNet** to public spending

About Me

Graduate student at **Mila** (Université de Montréal), building intelligent systems that push the **boundaries of optimization** and decision-making. Currently exploring **GFlowNet**-based architectures for **pricing** and **portfolio generation**. I strive to turn complex ideas into actionable models — always aiming higher.

Education

MSC	**Université de Montréal - Mila**, Computer Science	Montreal, QC, CA
	Supervisor : Prof. Margarida Carvalho	Sept 2025 – Aug 2027

- Research on **GFlowNet-based** for dynamic pricing and portfolio generation
- Focus on reinforcement learning, **combinatorial optimization**, and AI planning
- Funded by a $20,000/year **IVADO research scholarship**

BS	**Université de Montréal**, Economics - Honours Program	Montreal, QC, CA
		Sept 2022 – Aug 2025

- Research assistant on a project supervised by Prof. Arbour
- Worked in collaboration with the Chief Justice of the Quebec Superior Court (**$5,000 IQRDJ** *research grant) on **public institution spending** modeling*
- Teaching assistant for *Microeconomics I (ECN-2040)*, a **core** 2nd-year undergraduate course
- **GPA:** 3.825/4.3

Research Projects

Meta-FlowNet ⧉ — Mar 2025 – present

Mila – Master's Research Project (2025–2027)

- Designed a **novel** architecture combining **GFlowNets** with Physics-Informed Neural Networks (**PINNs**)
- Modeled the generation of CDF-like **structures** from reward-flow **trajectories** over continuous parameters
- Introduced adaptive sampling and active learning mechanisms to boost **efficiency** in hard regions
- Application: **dynamic portfolio** sequencing, stochastic optimization

Bilevel Pricing with GFlowNet ⧉ — Mar 2025 – present

Honours Thesis – Université de Montréal (2024–2025)

- Using a formulated a bilevel pricing model where consumers solve a knapsack problem to maximize utility
- Used GFlowNets with **Critic** to simulate consumer response and improve leader pricing strategy
- Integrated mixed-integer programming with generative flow dynamics

Transformer-GFlowNet for Sequential Portfolio Optimization ⧉ — June 2024 – present

Finalist – McGill-FIAM Hackathon 2024

- Developed a **Transformer-based** model to generate vectors of asset allocations
- Modeled transaction costs, turnover constraints, and **dynamic Sharpe** ratio optimization

- Used **MCMC**-based simulation for sequence interpretability and **XMAP** evaluation

Technical Skills

Languages: Python (advanced), LaTeX, Markdown, Bash, C (basic), Rust (beginner)

Machine Learning & Optimization Framework: PyTorch, Lightning AI, HuggingFace

Models: Reinforcement Learning (PPO, A2C), GFlowNet, PINNs, XGBoost

Tools & Dev environment: Git, Conda, Docker, JupyterLab

Competitions

McGill-FIAM Asset Management Hackathon - Finalist ⧉   Montreal
- Top 10 out of 66 teams   Nov 2024
- Built a **Portfolio Transformer** model that directly outputs allocation actions rather than predictions
- The objective function was the **Sharpe ratio**, optimized dynamically with transaction cost constraints
- Presented to a jury of finance professors and industry professionals

Polytechnique Montreal Datathon - 3rd Place ⧉   Montreal
- Designed an AI system to generate **financial reports** and commentary from raw data in 48 hours   Dec 2024
- Focused on financial language generation, analytics, and visual presentation of results
- Awarded a **$500** prize

Experience

Brasserie Henri - Birks Hotel, Busboy – Fine Dining   Montreal, QC
Delivered high-end service in a fast-paced luxury restaurant environment   Aug 2023 – Dec 2023
- Maintained exceptional client satisfaction during high-pressure shifts
- Developed attention to detail, **communication**, and teamwork skills

Sabrosa Restaurant, Busboy   Montreal, QC
Assisted with front-of-house service in a casual dining setting   Apr 2023 – Aug 2023
- Managed multiple tables and coordinated with kitchen staff under pressure
- Built interpersonal and **multitasking** skills applicable to client-facing roles

Languages

French: Native

English: Fluent

Extracurricular Activities

- Enjoy strength training and gym **discipline** — consistency builds both body and mindset

- Love working on personal tech projects, especially around AI, optimization, and simulation

- Driven by a long-term goal of launching a **startup** that transforms ideas into real-world impact