



Martin Catheland

MSc Student in Computer Science | AI & Data

22 years old – Lausanne, Switzerland

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Education

- 2024–Present **MSc in Computer Science - Specialization in Data Analysis / AI, EPFL, Lausanne**
Generative AI, Modern NLP, Computational Photography, Data Visualization, Applied Data Analysis.
- 2023–2024 **Exchange Program - Computer Science, KTH Royal Institute of Technology, Stockholm**
Ethical Hacking, Computer Security, HPC, Operating Systems, Web Security.
- 2021–2023 **BSc in Computer Science, EPFL, Lausanne**
Algorithms, OOP, Machine Learning, Linear Algebra, Probability & Statistics.

Experience

- 2024–Present **Freelance Web Developer**
Delivered 3 production websites for veterinary clinics and an oenology association using **Nuxt, Astro**, and the **Directus** CMS. Full lifecycle from architecture to hosting and CI/CD.
- 2022–2026 **Student Teaching Assistant, EPFL, Lausanne**
- Taught weekly sessions for up to 50 students within a 600-student cohort in **Intro to Programming (CS-107)** and **Discrete Math & Logic (CS-101)**.
 - Led debugging workshops, conducted code reviews, and graded software architecture projects.

Projects

AI & Machine Learning

- 2026 **Semantic Operator Optimization - EPFL Semester Project** *Ongoing*
Optimizing semantic operators (filters & joins) in LLM-augmented database queries, achieving **46% end-to-end** and **71% LLM call reductions** over prior state-of-the-art.
- 2025 **LaQwenTa - Academic LLM Assistant** [Report] [↗](#)
Implemented a STEM academic assistant by fine-tuning **Qwen3-0.6B** with SFT & DPO, built a lightweight RAG pipeline, and optimized inference via 4-bit quantization.

Data Engineering & Visualization

- 2024 **Gaming on YouTube - Big Data Analysis** [Demo] [↗](#) [GitHub] [↗](#)
Processed **300GB+** dataset with out-of-core lazy dataframes. Built relational network graphs and interactive visualizations.
- 2025 **DataRingz - Paris 2024 Olympics** [Demo] [↗](#) [GitHub] [↗](#)
Full-stack web app generating **10,000+ pages** for interactive Olympic athlete, venue, sport, and country exploration.

Software Engineering & Web Development

- 2024 **Whokipedia & Trackimo** [Whokipedia] [↗](#) [Trackimo] [↗](#)
Shipped two production apps: a daily celebrity guessing game with leaderboard, and a live gaming stats tracker with real-time database updates.
- 2023 **FaceDoodle - Face Tracking Drawing App** [Docs] [↗](#) [GitLab] [↗](#)
Face tracking app enabling drawing with head movements, connected to a 2D plotter for physical output.

Technical Skills

- Languages Python, Java, TypeScript, Scala, C, SQL
- AI / Data PyTorch, Hugging Face, vLLM, NumPy, Pandas, Polars, LLM Fine-tuning (SFT, DPO)
- Web & Tools Vue.js, React, D3.js, Docker, Git

Languages & Volunteering

- Languages French (native), English (professional), German (conversational)
- Volunteering **4L Trophy 2024–2025** - Co-organized a 6,000 km humanitarian rally delivering school supplies across Morocco.