Luca Mouchel

Visiting Student at MIT | Msc. Student in Data Science at EPFL

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Education

École Polytechnique Fédérale de Lausanne, MSc. in Data Science — Sept. 2023 – June 2026

- Specializing in Data Analysis, AI, NLP, Reinforcement Learning and Mathematics in Data Science.
- One of 15 recipients of the MSc Research Scholarship, working part-time at the AI Lab for 1.5 years.

École Polytechnique Fédérale de Lausanne, BSc. in Communication Systems — Sept. 2020 – June 2023

- Relevant Coursework: Signal Processing, Stochastic Models, ML, Probability and Statistics, Computer networks/security, Algorithms, Software Engineering.

Experience

Visiting Researcher, MIT – Boston, MA — Feb. 2026 – Aug. 2026

- Graph Machine Learning Research - Modeling the US workforce by tasks and building Markov Chains evaluating how tasks can be automated with AI

Machine Learning Research Intern, SLB-Research – Boston, MA — July 2025 – Jan. 2026

- Developed methods to interpret how vision models process sonic image data with GradCam++
- Integrated Vision Transformers in the pipeline, training from scratch on sonic image data with a flexible architecture including automated hyperparameter tuning experiments with AutoKeras.

Research Assistant – *Apertus* contributor, SwissAI Initiative – Lausanne, Switzerland — Jan. 2025 - July 2025

Developed post-training experiments for *Apertus*, a foundation model trained at SwissAI, with a focus on online RL (GRPO).

- Scaled the training for RL up to 70B sized models using Ray Clusters
- Developed an adaptive curriculum learning algorithm for RL using a task sampling approach with automatic difficulty increments based on task specific performances.
- Worked on evaluations, including Maths and QA evaluations.

Research Scholar, AI Lab, EPFL – Lausanne, Switzerland — Sept. 2023 - Feb. 2025

- Conducted research part-time on **reasoning** in LLMs as one of the Research Scholarship recipients. Led several projects, including improving LLMs' capabilities at generating logically sound arguments with preference optimization.
- Later worked on intermediates in causality and how LLMs can maintain epistemic consistency.

Research Assistant, ML for Education Lab, EPFL – Lausanne, Switzerland — Sept. 2022 - Feb. 2023

- Built a data analysis pipeline, combining data mining and NLP, to analyse self-regulated learning behaviors in keystroke logs.

Achievements

- Contributed to the post-training experiments of the Swiss foundation model ***Apertus*** (2M+ Downloads on HuggingFace)
- *Outstanding Paper Award:* "A Logical Fallacy-Informed Framework for Argument Generation" received the award at NAACL 2025.
- *Research Scholarship* (2023-2025): One of 15 research scholarship recipients for 2023/24 to work part-time in a lab.
- *Program Committee for AAAI 26' and ACL 26'*: Reviewing papers for AAAI's and ACL's next edition.
- *Publications at Master's Level*: 6 Publications at top venues including **AAAI**, **ACL**, **NAACL**, **Springer Nature**) with 30+ citations.
- *Travel Scholarships*: Received travel scholarships to travel to the **EDM** Conference in India and to **NAACL** in the US.

Selected Publications

- *Apertus*: Democratizing Open And Compliant LLMs For Global Language Environments
- **Luca Mouchel**, Debjit Paul, Shaobo Cui, Robert West, Antoine Bosselut, Boi Faltings. A Logical Fallacy-Informed Framework for Argument Generation. ***NAACL, 2025***, **(Outstanding Paper Award)**.
- Shaobo Cui, **Luca Mouchel**, Boi Faltings. Uncertainty in Causality: A New Frontier. ***ACL, 2025***.
- **Luca Mouchel**, Thiemo Wambsganss, Paola Mejia, Tanja Käser. Understanding Revision Behavior in Adaptive Writing Support Systems. ***International Conference on Educational Data Mining, 2023***
- Shaobo Cui, Junyou Li, **Luca Mouchel**, Yiyang Feng, Boi Faltings. Nuance Matters: Probing Epistemic Consistency in Causal Reasoning. ***AAAI, 2025***

Technologies & Skills

Languages: English, French, Italian, Spanish | **Programming Languages:** Python, Java, Scala, C, SQL

Technologies: Git, HuggingFace, Vim, Docker, RunAI, SLURM, PyTorch, Tensorflow, Keras