Pedro Morel

Machine learning engineer · AI evaluation, efficient models, civic tech · Paris, France
pmorelrosa@gmail.com · pmorelr.com · linkedin.com/in/pedro-morel · github.com/pmorelr

Machine learning engineer with a research background in dynamical systems and fluid mechanics, focused on R&D: following the frontier of the field and turning it into methodical, measured improvements for whatever the company or product needs. Built *Voto Lá Fora*, a civic-tech project that reached Brazilians voting abroad in 39 countries. Brazilian, based in Paris; works in English, French, Portuguese and Spanish.

Education

ENSTA Paris – Institut Polytechnique de Paris Sep 2020 – Jul 2023
Diplôme d'ingénieur (M.Sc.), Computer Science: AI and machine learning
GPA 4.0/4.0 · Thesis: *Medical code classification based on free-text clinical notes*

École Polytechnique Sep 2021 – Sep 2022
M.Sc. Fluid Mechanics, data-driven models
GPA 3.7/4.0 · Thesis: *Data-driven turbulence model for transitional aeroelastic instabilities*

Federal University of Rio de Janeiro (UFRJ) Mar 2017 – Dec 2023
B.Sc. Mechanical Engineering, French double-degree programme
GPA 0.88/1.00 · Final project: *Deep reinforcement learning for active flow control*

Experience

Calldesk Paris, France
Lead Machine Learning Engineer Jul 2025 – present
Voice-AI company whose callbots handle customer-service calls for large companies. Only ML specialist; technical owner of every AI and ML feature, from research spike to production.

- Designed the company's evaluation framework: it measures the production components themselves (speech recognition and synthesis, classification, entity extraction, LLM decisions) and replays full calls with LLM agents playing callers. It gates every release in CI and calibrates the LLM judges that monitor production.
- Chose small models over LLMs where benchmarks backed it: a FastText classifier for context-aware acknowledgements, served by a dependency-free TypeScript engine, answers in under 15 μs (p99) in six languages.
- Kept LLMs under explicit control where they stayed: a human-handoff fallback holds recall above 99% while cutting false triggers from 14% to 4%.
- Built the ML data platform from scratch: anonymised production data, multi-model pre-annotation checked by blind human validation, and versioned ground-truth datasets, so every model claim can be audited.
- Led the expansion beyond French: per-language speech-recognition benchmarks on telephone audio, synthetic data for regional languages, cross-lingual models.
- Implemented the company's first retrieval (RAG) pipeline and MCP server, so callbots answer from client documentation mid-call.
- Run biweekly paper discussions and internal workshops; co-designed the company's shared library of AI-agent skills.

Qantev Paris, France

Document AI Lead Dec 2024 – Jul 2025

- Led a team of five on document classification, OCR, named-entity recognition and medical coding for health insurers: R&D direction, sprint planning and priorities.

Machine Learning Engineer Mar 2023 – Dec 2024

- Research division: NLP, computer-vision and multimodal models for information extraction and structure recognition in health-insurance documents.
- Raised medical-code inference accuracy from 31% to 82% with label-wise attention.
- Made the database-mapping tool 400× faster with Levenshtein-based scores and locality-sensitive hashing.
- Built quantisation, LoRA fine-tuning and evaluation routines for LLMs.
- Technical voice in client demos and pre-sales meetings; ran biweekly paper discussions and supervised research interns.

ONERA, the French Aerospace Lab Meudon, France

Research Intern Mar 2022 – Aug 2022

- Improved turbulence models for wing aeroelasticity with data-driven optimisation constrained by the Navier–Stokes equations; a neural network generalised them to unseen configurations. Advised by Vincent Mons and Olivier Marquet.

Earlier research

ESPCI Paris – PSL (PMMH): bubble rise in a rapidly varying gravity field, simulated in Basilisk 2021

Wikki Brasil: CFD with OpenFOAM for the oil and gas industry 2019 – 2020

NIDF, UFRJ: statistical models of erosive wear, wear database and simulator 2018 – 2019

Institute of Physics, UFRJ: critical behaviour of the logistic map at the edge of chaos 2017 – 2019

Civic tech and public communication

Voto Lá Fora votolafora.com.br

Founder and sole developer Oct 2026

- In the first round of Brazil's 2026 presidential election, 6 in 10 Brazilians abroad did not vote, largely because of distance (164 polling places for 102 countries). Between the two rounds, designed, built and ran in three weeks a non-partisan noticeboard where people offered a seat in their car or a bed to voters far from their polling place.
- 1,571 volunteers offered rides or places to stay for 63 polling cities in 39 countries. Between the rounds, abstention abroad fell from 62.7% to 58.4% (39,677 more voters).
- Handled press and public messaging: TV Cultura (interview), Folha de S.Paulo, DW and g1.
- Next.js and Postgres with row-level security and 126 database tests; privacy by design. Open source.

Writing and awards

Automated medical coding: a review of the PLM-ICD framework, Qantev on Medium

Automated medical coding: tackling the problem with generative AI, Qantev on Medium

International Excellence Scholarship, ENSTA Paris 2022

BRAFITEC Excellence Scholarship, Franco-Brazilian engineering exchange 2020

Gold medal, Brazilian Physics Olympiad for Public Schools (OBFEP) 2016

Skills

Languages	Portuguese (native), English (fluent), French (fluent), Spanish (advanced)
ML and AI	PyTorch, Hugging Face, scikit-learn, LLM agents (LangGraph), RAG, MCP, speech (ASR/TTS), FastText, MLflow, Langfuse, Label Studio, DVC
Engineering	Python, TypeScript, SQL, C/C++, Rust, MATLAB; FastAPI, Next.js, Postgres, AWS, Databricks, Git
Interests	Film photography, piano, cinema, technology and society