

Gabriel Mahler

I build and ship ML systems (representation learning, detection, RAG) at research depth with production rigor.

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EDUCATION

University of Cambridge - *MPhil in Advanced Computer Science* **2024 - 2025**

- With Distinction. Modules in Machine Learning, Deep Learning, Scalable ML Systems, Reinforcement Learning.
- Master's thesis in enhancing route-finding in urban environments with semantic embeddings (81%).

Brown University - *BSc in Computer Science* **2020 - 2024**

- GPA: 3.7/4.0. Academic tracks: Artificial Intelligence, Software Principles.

TECHNICAL SKILLS

- **Programming Languages:** Python, Java, SQL, C/C++, JavaScript/TypeScript, R, OCaml.
- **AI/ML:** PyTorch, TensorFlow • **Infra & MLOps:** Docker, LangChain, Ray • **Data & Preprocessing:** Pandas.

WORK EXPERIENCE

Cambridge Conservation Institute (GBR) - *Machine Learning Researcher* **June 2025 - present**

- Enhanced and developed machine learning models with geospatial datasets in environmental protection projects.

Lixandria (USA) - *AI Engineer (NDA)* **July - August 2024**

- Designed and built a cost-efficient prototype for a Retrieval-Augmented Generation (RAG) system. Leveraged cutting-edge research, developed custom algorithmic enhancements, and utilized tools such as LangChain, scikit-learn, vector databases, and LLM APIs (OpenAI & Anthropic).
- Delivered a scalable proof-of-concept and future-ready codebase for processing tens of thousands of documents.

Lifespan (USA) - *Machine Learning Researcher* **June - August 2023**

- Researched and developed Vision Transformer models using Masked Auto-encoder pre-training for detecting aortic aneurysms, collaborating closely with Brown Medical School. Reviewed over 50 relevant scientific publications.
- Achieved 97% validation accuracy, and leveraged over 100 GB of medical data, combining public imaging datasets with proprietary clinical records.

Firefish (CZE) - *Technical Consultant* **June - July 2022**

- Worked on foundational product and strategy decisions at an early-stage Bitcoin lending marketplace startup.
- Researched strategy and blockchain technologies of over 10 crypto marketplaces, analyzed competitive advantages and disadvantages, and presented findings to the founders.

RELEVANT PROJECTS

Tabular Encoders in Contrastive Learning **2025**

- Enhanced a state-of-the-art multimodal contrastive learning framework by expanding its tabular encoders with deep MLPs and a custom transformer-based model. Used PyTorch for the implementation.
- Achieved up to +2 pt AUC improvement on downstream classification of rare medical diseases using a dataset of over 3,600 radiology reports and 8,100 associated X-ray images.

Modeling of Double Pendulum Dynamics **2025**

- Built a machine learning model to simulate the chaotic dynamics of a double pendulum, focusing on predicting and minimising the system's time to first flip.
- Utilised Python libraries including GPy and Emukit for Gaussian process modelling, Bayesian optimisation, and experimental and kernel design. Leveraged Runge-Kutta methods to simulate the motion numerically.

LLM Fine-Tuning via Reinforcement Learning with Human Feedback (RLHF) **2025**

- Extended an RLHF fine-tuning pipeline for sentiment-aware text generation using a custom DistillBERT evaluator and GPT-2 scalar head. Applied PPO, A2C, and XPO (via PyTorch/TensorFlow) to GPT-2 and Pythia-70M, with KL-penalty control and exploration bonuses.
- Delivered a 30-50% uplift in positive-sentiment win-rates and coherence on a 200-prompt benchmark, validated via Llama3.2 LLM judges and the pysentimiento toolkit, outperforming non-RLHF and supervised baselines.

ATHLETIC EXPERIENCE

Rowing

- Czech National Team (2017 & 2018 & 2020 & 2022). Competed at three World Championships, three European Championships, and Youth Olympic Games.
- Cambridge University Boat Club (2024-25). Winner of the 2025 Cambridge vs. Oxford Boat Race.
- Brown University Men's Crew, 1st Varsity Boat (2020-24). Awarded 3x Scholar-Athlete, 4x All-American, and the Brown Men's Crew's 2024 Judah Rome Award for team spirit and selfless attitude.