MATÍAS BILKIS

Applied AI Scientist & Engineer — RL/optimization, end-to-end systems (Python)

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Professional Summary

Applied ML Engineer & Scientist with 10+ years building optimization, statistical inference, and deep learning frameworks for complex systems. PhD in Physics (Universitat Autónoma de Barcelona, Cum Laude).

Co-founder and leader of research engineering teams in Spain & US delivering production-ready code for academic and industry partners.

Maintains 10+ open-source repositories: full-stack web apps, Python libraries, large-scale ML codebases.

Core skills: building ML decision-making systems end-to-end with SWE practices. Shipped end-to-end ML systems: data→training→evaluation→deployment-ready code, with reproducible pipelines and HPC.

Core Skills

Languages: Python (expert, 10+ years), Bash, (basic) R, Julia, JavaScript, HTML, CSS

ML/DS: Reinforcement learning (DQN, MCTS, DDPG), time-series modeling, statistical inference, Bayesian optimization, large-scale optimizers

Frameworks: PyTorch, TensorFlow, JAX, scikit-learn, NumPy, SciPy, pandas, Matplotlib

SWE: Library/framework dev, ML engineering, agentic AI stack (CLI, Claude Code, Cursor, Sonar-Perplexity), large-scale codebases (150+ commits), multi-language implementations, HPC workflows, basic web development (JS/CSS/HTML), real-time audio systems (OSC, SuperCollider, TidalCycles), reproducible research-to-code, dependency management, custom quantum frameworks

Infrastructure: Git/GitHub, HPC (Slurm, HTCondor), distributed Monte Carlo pipelines.

Selected Projects (Open Source)

Automated RL calibration of experimental sensors — Production-ready Python library for model-free RL agents (TensorFlow). 30+ citations, 4 papers, 2 supervised theses, 6+ talks.

Neural network architecture search for quantum computing — Quantum circuit optimization. Multi-language: Python + PennyLane. Collaboration: Los Alamos, Google's Alphabet X. 60+ citations.

Online LaTeX Equation rendering — Full-stack web app (JS/CSS/HTML) for LaTeX rendering. Built with agentic AI collaboration.

Deep reinforcement learning experiments for quantum communications — Large-scale deep RL (150+ commits, TensorFlow) for continuous-time automatic control of AI agents.

Machine learning scientific discovery applied to time-series forecasting and modeling — Automated data science and scientific discovery with deep learning, focused on real-time time-series processing of quantum sensing data.

Generative AI with quantum computers — Quantum GANS and difussion models for alternative image-processing tasks.

Hands-on Quantum Machine Learning introductory course — Hands-on introduction to Quantum Machine Learning; departs with writing code from scratch, then penny-lane and finally cuda-q

Experience

Applied scientist & consultant 2025–Present
QutSur — Remote *Argentina / USA / Spain*

Argentina HPC ecosystem advisor, for hybrid classical-quantum optimization (10 institutions, NVIDIA). QML course delivery, strategic consultancy (CVC). LATAM Quantum tech ecosystem building.

Web3/blockchain community/partnerships: quantum residency organizer at Edge City; DevConnect '25 decentralized science hub organizer.

Led stakeholder alignment for quantum application R&D; moderated IEEE Quantum Week 2025 panel; drove AI ethics activity with 5+ international stakeholders.

Co-Founder & Director of R&D, QML Group 2023–2025
Computer Vision Center (CVC) *Barcelona, Spain*

Built and led 9-person research engineering group delivering production-ready code. Supervised 10+ open-source repos. Secured and executed 500k+ EUR in funded projects with industry milestones (GMV, Anyverse, EURECAT, Rovimática).

International collaboration leader (US, LATAM, Europe). Organized monthly seminar series (10+ events) with speakers from Xanadu, Quantinuum, IBM, US National Labs, Max Planck Institute, and other top-tier institutions.

Delivered 4 CI pipelines; shipped 2 production-ready repos (genAI) and 2 RL optimization systems.

PhD Researcher (applied ML/AI coding & quantum research projects) 2018–2023
Universitat Autònoma de Barcelona (UAB) *Barcelona, Spain*

Developed ML and sequential testing algorithms as reusable Python libraries with HPC workflows. Built model-free AI agents for complex modeling and calibration beating baselines.

Engineered HPC workflows (Slurm/HTCondor) for Monte Carlo simulations and large-scale parameter sweeps.

Research Fellow 2020
Los Alamos National Laboratory (LANL) *USA*

Designed VAns variable-structure architecture search; open-source implementations (qvans, multivans) with releases, dependency management, 60+ paper citations.

Education

PhD in Physics (Cum Laude, 10/10) — Universitat Autònoma de Barcelona (UAB), Spain 2018–2023

Licenciate in Physics (GPA 9.5/10, honors) — Universidad Nacional de La Plata (UNLP), Argentina 2013–2018

Teaching: 10 years experience, 6 courses across 3 universities, 400+ hours, 300+ students. Currently: Professor Universidad Abierta Interamericana (UAI) in Quantum AI software specialization.

Supervision: 9 students: 1 PhD (co-supervised), 3 master theses (2 honors), 5 undergraduate projects.

Publications, Recognition & Languages

Publications: 9 papers (6 peer-reviewed + 3 preprints); 115+ citations; h-index 4.

Reviewer: Nature Machine Intelligence, Quantum Journal, IEEE Quantum Week, QTML, NeurIPS Creative AI.

Awards: Cum Laude PhD '23, Sónar-UPC Hackathon winner '21, supervised student won best-thesis award '24.

Talks delivered at: (selected) CERN, Fermilab, Max Planck, ICFO, Practia Global, DevConnect, LABITConf.

Languages: Spanish (native), English (C2), Catalan (fluent), French (A2), Yiddish (A1), Music (guitarist, tenor)