Dhia Garbaya

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Profile

Recently focusing on *RL, reasoning, distillation, and pre-training* of language models at scale.

Open to research and PhD opportunities in 2026.

Education

École Normale Supérieure (P-S), MVA: MSc [Math, Vision, Learning] 2025 – 2026

- **Coursework:** Convex optimization · Reinforcement learning · Probabilistic graphical models · Bayesian ML · Geometric deep learning · Graphs in ML · LLMs for code and proof · Online algorithms · Robotics...

École des Ponts et Chaussées (IP Paris), MEng [Applied Math, ML] 2022 – 2026

- **Coursework:** Machine learning (JAX) · Deep learning (torch) · Optimization · Operations research (Julia) · Advanced algorithmics (C++) · Vision · Stochastic processes · Statistical physics · PDEs · Game theory...

Esprit Prépa, Tunis, Prépa [Math, Physics] 2020 – 2022

- **Coursework:** Algebra/ Topology/ Analysis/ Probability/ Theoretical Physics/ Algorithms...

Experience

AI scientist Internship || `Mistral AI - FR` Apr'26 - Oct'26 (upcoming)

- Team: `Reasoning/RL`
- Supervisor: Albert Jiang (Tutor: Michal Valko)

Research Visit/Internship || `EPFL - Switzerland` Feb'25 - Jan'26

- Teams: `MLO` lab & `Swiss AI Initiative`
- Supervisor: Prof. Martin Jaggi
- Focus: efficient LLM pre-training (4k GPUs), knowledge distillation, model architecture.
- Recently: over-thinking + exploration-exploitation in GRPO.

Research Internship || `TII - UAE` Jul'24 – Jan'25

- Teams: `AI theory` & `Falcon LLM`
- Supervisor: Dr. MEA Seddik
- Focus: knowledge distillation, scalable optimization algorithms (1st and 2nd order)
- Large-scale parametrization (MuP), param-free learning, pre-training (5k GPUs)

Publications

Terminator : Learning Optimal Early Stopping in CoT Reasoning · **ICLR'26** Openreview
UT Austin & EPFL - 2026 Soon on arXiv

FOG Architectures* : Toward Pure FP8 LLM Training at Scale · **NeurIPS'25** arXiv · Openreview
EPFL & ETH Zurich - 2025

Apertus* : Democratizing Open, Compliant, and Multilingual LLMs arXiv
Swiss AI team - 2025 under review

Falcon3 family of Open Models* : Showcasing transfer learning efficiency Official blogpost
Falcon LLM team - 2024

* first co-authorship

Coding skills

Languages: Python, C++, Julia, R

Tools, frameworks: Pytorch, JAX, Megatron-LM, NeMo, HF libraries, GIT, AWS, Slurm, Run:ai

Academic projects

Solving PDEs with PINNs [dhia680/pinns-24]

- Studied Physics-Informed-Neural-Networks for solving Helmholtz PDEs [w/ Airbus].

Deep RL for optimizing traffic using autonomous vehicles (exploratory) [.../HighwayEnv]

- Inspired from CIRCLES project. Studied phantom traffic jam and drivers behaviour.
- Used existing codebase to train a policy with DQN, PPO.

Operations Research 2023-2024

- Optimizing an offshore wind electrical network for RTE, FR
- Optimizing a car manifacturing chain for Renault, FR

RL for push recovery of a wheeled robot 2025

- PPO, Reward shaping, curriculum, inductive bias · [Robotics (Willow, Inria)]

Posterior Estimation and Importance Sampling [dhia680/NPE-IS]

- Studying neural PE and IS for gravitational waves · [Bayesian ML (Mines Paris)]
- A focus on the forward KL divergence objective

Distinctions, Online certificates

- **French government excellence scolarship**: Among 7 national holders of this scolarship, 2022-2026
- **Valedictorian** in both high school and Prépa
- **Completed certificates**: NLP with Python (Udemy) · Supervised Learning, RL (deeplearning.ai)
- **Research grant**: part of a large project on model compression, funded by the Swiss AI Initiative and led by D. Alistarh, M. Jaggi, T. Hoefler

Languages

- **Arabic** (Native) · **English** (Fluent) · **French**: (Fluent) · **German**: (Intermediate)

Volunteering

- **Reviewer** for MenaML'25, ICLR'26.
- **Project Manager** in the Junior Enterprise of Ecole des Ponts (2023 - 2024).