

Dhia Garbaya

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dhia680.github.io | github.com/dhia680

Profile

Curious about universal approximators and neural networks.

Focusing on transfer learning, NLP, optimization, and reinforcement learning, for now.

Education

Ecole Nationale des Ponts et Chaussées (IP Paris), MS in Applied Math and ML Aug 2022 – Aug 2026

- **Coursework:** Machine Learning (JAX)/ Deep Learning (torch)/ Convex Optimization/ Operations Research (Julia, Python)/ Advanced Algorithmics (C++)/ Stochastic Processes (MDPs, Martingales)/ Statistical Physics Stats in high dimensions/ PDEs/ Vision/ Game theory...

Esprit Prépa, Tunis, Prepa for Grandes Ecoles Sept 2020 – July 2022

- **Coursework:** General, Linear Algebra/ Topology/ Analysis/ Theoretical Physics/ Eng sciences
- **Project:** Optical and thermodynamical optimization of solar cells.
- **Grade:** Valedictorian

Experience

Visiting Student | Research Intern, EPFL, Switzerland Feb 2025 - Aug 2025

- **Lab:** MLO
- **Supervisor:** Prof. Martin Jaggi
- Member of **Swiss AI Initiative** LLM team (training on ALPS cluster).
- Interest in: transfer learning, low-precision training, model architecture, HPs scaling laws.

Research Intern, Technology Innovation Institute – Abu Dhabi July 2024 – Jan 2025

- Scalable optimization algorithms of 1st and 2nd order + parameter-free learning
- Knowledge distillation for **Falcon LLMs** + Large scale transformer parametrization
- Contributing to: pretraining on large cloud clusters + open source frameworks
- Member of **Falcon3** and the following larger iteration teams

Club Project Manager, Junior Entreprise – Ile-de-France March 2023 – May 2024

- Responsible for technical and AI related studies
- Contributed to an annual revenue of +125K\$

Projects

Solving PDEs with PINNs, ENPC+Airbus github/dhia680/pinns-24

- Studied Physics-Informed-Neural-Networks for solving Helmholtz PDEs.

RL for optimizing traffic using autonomous vehicles github.com/.../HighwayEnv

- Academic research project, inspired from CIRCLES project (Berkley, Rutgers, Ecole des Ponts..).
- Studied phantom traffic jam, drivers behaviour. Used existing codebase to train a policy with DQN, PPO
- Tools: Pytorch, Sumo simulator.

RNN-based NMT model github.com/dhia680/NMT

- Trained an LSTM-based machine translation toy model (20M) and integrated it in a web interface
- Tools: Tensorflow, Pandas.

Operations Research

2023-2024

- Optimizing an offshore wind electrical network for RTE, FR
- Optimizing a car manufacturing chain for Renault, FR
- Tools: Python, C++, Julia, Gurobi (MIP), S.Annealing

Coding skills

Languages: Python, C++, Julia, R.

Tools, libraries: GIT, AWS, cluster computing, linux, Pytorch, JAX, Megatron-LM, NeMo, HF libraries

Distinctions, Online certificates

- **French government excellence scholarship:** Among 7 national holders of this scholarship, 2022-2026.
- **NLP** with Python, Udemy.
- **Supervised Learning, RL**, deeplearning.ai.
- **In progress:**
 - Accelerated computing with cuda (python and C++), Nvidia.
 - Advanced RL in python, DQNs, Udemy.
 - Diffusion Models, Nvidia.

Languages

- **Arabic:** Native
- **French:** Fluent
- **English** Fluent
- **German:** Intermediate