Dhia Garbaya

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Profile

Particularly interested in Reinforcement Learning, Optimization and NLP.
I am looking for a **6 month** research internship starting in **Jan-Feb 2025**.

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 (R)/ Vision...

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

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

- Exploring scalable optimization algorithms of 1st and 2nd order
- Knowledge distillation from **Falcon LLMs**
- Large scale transformer parametrization (scaling laws).
- Contributing to pretraining on 1000s of GPUs + open source training framework
- Aiming to submit a paper by January 2025

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

- Responsible for technical and AI related studies
- E.g., AI for railway sector with SopraSteria
- 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 manifacturing chain for Renault, FR
- Tools: Python, C++, Julia, Gurobi (MIP), S.Annealing

Coding skills

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

Libraries, tools: GIT, AWS, cluster computing, linux, Pytorch, JAX, Megatron-LM, HF frameworks.

Distinctions, Online certificates

- **French government excellence scolarship**: Among 7 national holders of this scolarship, 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.