Elouan GARDES

Application to the MVA master-2

Télécom Paris engineering student currently in exchange at ETH Zürich studying machine learning and applied mathematics.
Passionate about representation and self-supervised learning with vision, and about planning in artificial agents.

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Permis B

https://github.com/El-One1

GRE SCORE

Results for the Graduate Record Examination (GRE)
166/170 in quantitative reasoning
162/170 in verbal reasoning
5/6 in analytical writing

LANGUAGES

French
Native language

English
Fluent - C2

German
Academic level B1-B2 (intermediate)

Italian
Academic level B1-B2 (intermediate)

CS SKILLS

- Machine-Learning: pytorch expertise, tensorflow, sklearn
- Languages: Python expertise, Java, C
- Data structures
- Big Data: spark, jsoniq, xml, json, sql

ACADEMIC INFORMATION

Exchange in the Master of Science in Computer Science

ETH - Zürich - From September 2023 to August 2024

- Major in Machine Intelligence, Minor in Data Management System
- Courses in Deep Learning, Probabilistic Machine Learning, AI safety, AI explainability, statistics.
- Research-oriented CS Master. Ranked 4-5th in the World by reference rankings QS and THE.
- 5.7 / 6.0 GPA

Engineering degree - Master in Engineering

Institut Polytechnique de Paris - Télécom Paris - Palaiseau - Since September 2021

- Specialization in Computer Vision, Machine Learning, and Statistics. Minor in Data Science.
- 3.93/4.0 GPA

Preparatory classes

Lycée Michelet - Vanves - From September 2019 to July 2021

- Intensive program preparing for french national competitive exams for engineering schools. Classes in maths, computer science, physics
- Competitive project: developped a drone software to follow objects and humans through AI and servo.
- 4.0 GPA

RESEARCH EXPERIENCES

Explainability and interpretability in medecine-related vision tasks

ETH Zürich - Under Julia Vogt - From February 2024 to June 2024

Systematic review of typical post-hoc explainability techniques and interpretable models for classification in X-ray pneumonia prediction.

- Review of performance drops when using interpretable models,
- In-depth review of the relevance and adverserial behaviour of post-hoc explanations from widely-used techniques like Grad-Cam or Integrated-Gradients,
- Assessment the ease of use of deep-learning models for practitioners when adding explanations or interpretability to models, to better assess the need for these techniques in wide-spread adoption of practical deep-learning in medecine.

Hyper-optimization for deep-learning

ETH Zürich - Under Thomas Hofmann - From September 2023 to January 2024

Project in a team of 3 aimed at studying and improving hyper-optimization techniques in deep-learning, ranging from online-learnable learning-rates (LR) to online tuning of new activation functions through backpropagation. Workshop paper and code here.

- Development of a new state-of-the-art adaptive gelu activation function beating all other activation functions on all tested benchmarks (including imagenet) in vision tasks,
- Improvement on automatic-online LR tuning by the use of a smoothing link-function and proved its superiority over SOTA LR hyper-optimization on all tested benchmarks,
- Study of properties and best-practicies when using hyper-optimization in deep-learning.

Self-supervised and multi-instance learning in vision

Télécom Paris - Visiomel challenge - France - From May 2023 to July 2023

Project in a team of 4 aimed at predicting cancer relaspe from skin fragments. Dataset given through the Visiomel competition, based on real whole slice images. Paper here.

- Self-supervised learning to learn meaningful representations from unlabeled instances through SimCLR, DinoV2 and ByOL.
- Multi-instance learning + attention module to predict at the whole slice level the relapse probability of patients and interpret predictions.
- Unofficially beat best metrics from the competition - not considering all practical problems

Deep-learning vs classic computer-vision for histopathology segmentation

Télécom Paris - France - From June 2022 to July 2022

Project aimed at improving contrast and usability of histopathology images.

- Investigation of the best ways to improve image quality in the regions of interest found by deep-learning and computer-vision techniques
- Comparison of traditional computer vision techniques and an improved U-net in finding cell boundaries, in terms of ressource efficiency and results