

THÉOPHANE VALLAEYS

Student at ENS Paris, focusing on research in Machine Learning

@ theophane.vallaey@ens.fr

+33 7 82 59 27 02

Paris

webalorn.com

github.com/webalorn

I am a student at the ENS Paris specializing in Machine Learning and theoretical computer science with a strong research focus. I have been focusing on ML through the IASD Master (Artificial Intelligence, System, Data) and research internships, including one at Meta AI (FAIR Paris). My passion for CS also extend beyond classes, as shown by my achievements in competitive programming competitions and my involvement in personal and school projects.

EDUCATION

IASD Master

2022 - 2023

Paris

The IASD Master (Artificial Intelligence, Systems, Data) is a partnership between the ENS, Dauphine and Mines (members of the PSL university). It focuses on both theoretical and practical aspects of AI and deep learning. Obtained with the highest honors.

ENS Paris (École normale supérieure)

Licence and Master

2020 - 2024

Paris, rue d'Ulm

The ENS is a prestigious institution of higher education providing high-level training in research to students who will become professors, researchers and engineers in their field.

- **2023-2024** : Final year, focusing on research projects.
- **2021-2023** : Master at the ENS, focusing on Machine Learning.
- **2020-2021** : Licence (equivalent to a Bachelor's degree) in Computer Science.

CPGE MPSI & MP*

Faidherbe

2018 - 2020

Lille

Classes Préparatoires, a two-year intensive course preparing for highly competitive, national entrance examinations to French Grandes Ecoles (including engineering schools and the ENS).

WORK & OTHER EXPERIENCES

4-months research internship at Meta AI (FAIR)

2024

Meta AI, Paris

Internship under the supervision of Jakob Verbeek, working on adaptive neural compression on embeddings, and its application to large-scale search.

5-months research internship at Meta AI (FAIR)

2023

Meta AI, Paris

Internship under the supervision of Jakob Verbeek, in collaboration with Matthieu Cord from Sorbonne University. I worked on data-efficient and cost-efficient architectures to augment Large Language Models (such as LLaMA) with multi-modal information

SKILLS

Python

PyTorch

Tensorflow

Numpy

C++

Web

OCaml

LaTeX

Linux

Machine learning

Deep ML

Research

Algorithmic

Bayesian Optimization

Mathematics

French

English

CS COMPETITIONS

International Olympiads in Informatics (IOI)

- IOI 2018, Japan (silver medal, 30th)
- IOI 2017, Iran (bronze medal, 123rd)
- IOI 2016, Russia (bronze medal, 88th)
- IOI 2015, Kazakhstan (205th)

MDF (Meilleur dev de france / Master Dev France)

1st place in 2019 and 2023 (the 7th and 8th editions), over 1600 to 2000 competitors

A French competition with students and professionals of the computer science industry. The competition consisted of solving algorithmic exercises.

Other competitions

online and on-site

Codeforces, SWERC, PrologIn, Algoréa (french competition, 2nd in 2015), BattleDev (1st and 2nd in 2018 and 2019), FARIO, Codingame, infO(1) cup, USACO, Google code jam, AXA code challenge (1st team), *Le Shaker* coding battle (1st in 2021, 2022 and 2023), Kiro (optimization, 1st team in 2021, 2nd team in 2022), TRACS (13th team in 2021, 3rd team in 2022, organized by CentraleSupélec and the DGSE).

(images, audio, etc.), to complete diverse tasks such as captioning or question answering. Work published at an ECCV workshop.

5-months research internship at the AutoML lab

📅 2022

📍 University of Freiburg, Germany

This internship focused on trying to improve Bayesian optimization techniques for the case of hyperparameter optimization for large neural network models. I took part into the development of the **neps** and **metahyper** libraries.

2-months research internship at Inria

📅 2021

📍 Inria

A 8-week research internship for my *Licence*. I worked on using an extended version of the possibility-necessity theory inside deep neural networks. A report is available at <https://hal.inria.fr/hal-03338721> (in French).

Backend development in PHP

For www.manager.one

📅 September 2016 – February 2017 (6 months)

I worked with a team on the backend of the website, for SaGa Corp and the *Wormser Frères* bank. I learned to work with a team on a large project and to ensure code of quality.

PROJECTS

Projects during CPGE, IASD and ENS

Some of my school projects

- Text summarization using the OPT language model, fine-tuned with LoRA. Group project at IASD (pytorch, <https://github.com/webalorn/OPTimal-summary>).
- Finding approximate solutions for MaxSat using SOTA algorithms based on Monte Carlo. Group project at IASD (C++, code and report at https://github.com/webalorn/mc_maxsat).
- Rank 91 at the Lux AI challenge, season 2. Final project in a IASD class (Python, <https://github.com/webalorn/tita-lux2>).
- Converting a pre-trained speech-to-text model from English to French. Group project at ENS (pytorch, <https://github.com/webalorn/projet-ml>).
- Compiling the Heptagon reactive language for an Arduino card (C/C++, <https://github.com/webalorn/heptaboard>).
- Small compiler for Julia, ENS (C++, <https://github.com/webalorn/pjulia>).
- Designing and simulating a RISC-V processor, at ENS (C++, demo with a clock and a 3D simulation, <https://github.com/webalorn/sysnum-2020-project>).
- Bare-bones OS with a microkernel, group project at ENS (zig, <https://github.com/RaitoBezarius/A0>).
- DeepMola: small deep learning library, aiming for Theano what Keras is for Tensorflow. Used to learn to classify a large number of fish species using few-shot learning, combined with a high-dimensional k-NN algorithm based on graphs in the latent space. In CPEF (Python, <https://github.com/webalorn/deep-mola>).

ACTIVITIES & HOBBIES

- Informatic competitions.
- Member of the Prologin and France-IOI associations
- Historical European Martial Arts (long sword).
- Game Master in role-playing games and invested in TTRPG communities.
- Reading SFF books.