MAXIME PIRES AI Engineer | CentraleSupelec

AI Engineer graduated from CentraleSupelec with expertise in **Deep Learning** (Low-level Architecture & NLP). Proven ability to build complex ML solutions and optimize data pipelines. Passionate about combining mathematical rigor with software engineering.

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EXPERIENCE

AI Engineer - Intern

French Ministry of Armed Forces

September 2024 – February 2025 Paris

R&D on semantic and syntactic corpus analysis via Word Embeddings.

- Design of an end-to-end NLP pipeline for massive corpus semantic analysis (several GB): from pre-processing (cleaning, tokenization) to optimized vectorization.
- Comparative analysis of state-of-the-art (SOTA) language models (Word2Vec, BERT, GPT) to guide architectural choices towards the most robust solution.
- Vector representation optimization: Development of custom evaluation metrics (erank, edim) to maximize informational density and reduce vector dimensionality.
- *Stack: Python, Scikit-learn, Gensim, Transformers, Pandas.*

Data & Full Stack Engineer - Intern

French Ministry of Armed Forces

February 2023 – August 2023 Paris

Creation of a tool to facilitate scientific data processing.

- Development of a scientific web application (Next.js) to centralize and streamline critical data analysis.
- Drastic performance optimization: Implementation of algorithms allowing automated processing of thousands of folders in seconds, replacing costly manual analysis.
- Design of a relational database ensuring scientific data integrity and real-time access to results (PostgreSQL).

PROJECTS

MPNeuralNetwork

Deep Learning library built from scratch in Python/NumPy (vectorized)

- Manual implementation of Layers (1D & 2D with 'im2col'), Optimizers (Backpropagation), Losses, Activations, and Metrics.
- "Smart" engine to automate Deep Learning best practices (early stopping, checkpoints, weight initialization, regularization).
- Performance optimization: x4 speedup thanks to full vectorization (Batch processing).
- Numerical stability management (Log-Sum-Exp trick).
- **Industrialization & Quality**: Automated CI/CD pipeline (GitHub Actions), static typing (MyPy), modern linting (Ruff, Pre-commit), and unit tests (Pytest).

Handwriting Recognition

Real-time GUI application for digit recognition (MNIST)

- Direct application of MPNeuralNetwork.
- 98% accuracy with a Fully Connected network, 99% with a CNN.
- Image pre-processing pipeline (Center of mass, Resizing) similar to MNIST standards.

EDUCATION

CentraleSupelec

Artificial Intelligence

2023 – 2025 Paris

Double Degree

ECE - Engineering School

Information Systems

2019 – 2023 Paris

International Section

SKILLS

AI & Data Science

Python · Scikit-learn · SQL · PyTorch · Pandas · NumPy

Engineering & DevOps

Git · Linux · Docker

Web & App

React · Next.js · TypeScript · C++ · Java

LANGUAGES

C2 **French** Native

C1 **English** TOEIC 965/990

INTERESTS

- **Computing** Open-source, Unix
- **Sports** Handball, Cycling, Diving
- **Scientific Outreach** Maths, Physics, Biology
- **Arts** Cinema, Reading, Music