LOUIS MONIER

Graduate of École Normale Supérieure of Lyon & Mines Paris with a PSL Master in AI/ML.
Strong experience in data engineering and reinforcement learning, published research at NeurIPS, and passionate about building scalable AI-driven solutions.

Work & Research Experience

Spark *Paris, FR* *Feb. 2021 – Present*
Head of Data (Permanent position)

- First technical hire, designed and implemented scalable data infrastructure, processing millions of records daily; improved processing efficiency by 40%.
- Leading a team of 4 data engineers to drive data-driven decisions and optimize marketing performance.
- Built ML-powered analytics tools (computer vision, classification models) improving accuracy of performance metrics by 25%.

InstaDeep | La Sorbonne *Paris, FR* *Apr. – Nov. 2020*
AI Research Intern

- Conducted research on deep reinforcement learning
- Published a first-author paper at NeurIPS Offline RL workshop: [Paper Link].

ENGIE (Innovation Dept) Paris, FR Oct. 2018 – Sep. 2019
Data Scientist intern

- Conducted techno-economic analysis on cost reductions in renewable gas, contributing to a published technical study.
- Developed analytical models to assess the feasibility of renewable gas plants.

Akuo Energy (Innovation Dept) *Dubai, UAE* *Apr. – Sep. 2018*
Software Engineer

- Developed software to optimize the operation of renewable power plants with battery storage.

Harvard University *MA, USA* *Apr. – Jul. 2017*
Graduate Research Assistant

- Developed and refined numerical models to simulate Earth's atmospheric dynamics, translating complex physical equations into efficient computational code.
- Optimized large-scale climate simulations, leveraging parallel computing on a high-performance data center to process millions of data points efficiently.

University of California San Diego (Department of Physics) CA, USA May – Jul. 2016
Graduate Research Assistant

- Engineered a comprehensive experimental setup to investigate the effects of bacterial suspensions on fluid viscosity.
- Developed custom computer vision algorithms to automatically track flow velocity and profile from high-speed video recordings.

École Centrale de Lyon (Ampère laboratory – CNRS) Lyon, FR Jun. – Jul. 2015
Research Intern

- Investigated wireless power transmission via inductive coupling enhanced by metamaterials

Physics Examiner (in Classes Préparatoires (CPGE)) Lyon & Paris, FR 2015 – 2020

- Served as an examiner for 2–3 hours per week over 5 years in an intensive scientific program.

Education

Master in AI & Data Science (IASD, PSL) Paris, FR 2019 – 2020
Joint PSL Master program between ENS Paris, Mines Paris & Paris Dauphine University

- Advanced courses on ML, deep & reinforcement learning, Optimization, NLP, computer vision, etc.

École des Mines Paris – PSL Paris, FR 2017 – 2019
Engineering degree

- General training in Applied Mathematics, Computer Science, Economy, Law, Finance, etc.

École Normale Supérieure de Lyon Lyon, FR 2014 – 2017
BSc + MSc in Physics

- Admitted after 2 years of Classes Préparatoires (CPGE)

Data Science & ML Projects

Highlighted Projects:

- **CrossFit Movement Tracking (Pose Estimation + IMU Fusion)**
  Collaboration with Competition Corner
  Developed hybrid system integrating pose estimation (CNNs, Transformers) and sensor data for precise movement tracking. Built real-time classification models improving accuracy significantly.
- **Recommendation System with Contextual Bandits (RL)**
  Implemented reinforcement-learning-based recommendation systems (Linear Bandits, UCB, Thompson Sampling), optimized content personalization, achieving 15% improvement in engagement metrics.

Additional Projects:

- **CrossFit Movement Tracking with Pose Estimation and IMU Fusion:** In development in collaboration with Competition Corner. Combined pose estimation algorithms with body-mounted IMU sensors, incorporating classification techniques to recognize and analyze the movements performed.
- **Machine Translation (GANs + NLP):** GAN-based neural machine translation.
- **Robust Neural Networks (Adversarial Training):** Explored robustness in DL.
- **3D Point Cloud Classification:** CNNs, PointNet models for LiDAR data.
- **Connected Components in Large Graphs:** MapReduce distributed algorithms.
- **Distributed Optimization (Gradient Descent):** Apache Spark implementations.
- **Deep RL (DQN, PPO, SAC):** Implemented from scratch in PyTorch.

Publications

Offline Reinforcement Learning Hands-On (*NeurIPS Workshop, 2020*)
L. Monier, J. Kmec, A. Laterre, T. Pierrot, V. Courgeau, O. Sigaud, K. Beguir

- First-author publication on practical implementation of offline RL algorithms (DQN, PPO, SAC), presented at NeurIPS Workshop 2020.
- PDF | arXiv | Slides

Technical Skills

LLMs & GenAI: GPT models, fine-tuning, prompt engineering, LangChain, Hugging Face, RAG architectures, LLM evaluation methods

Programming Languages: Python, SQL, Bash, JavaScript

ML Frameworks & Tools: PyTorch (expert), TensorFlow, scikit-learn, OpenAI API, FastAPI, Streamlit

Data Engineering: Apache Spark, Hadoop, Airflow, dbt, ETL Pipelines

Cloud & DevOps: Docker, Kubernetes, Git, CI/CD pipelines, Terraform, GCP, AWS

Databases & Storage: PostgreSQL, Snowflake, BigQuery, Redis

Other Tools: GitHub, GitLab, LaTeX, HTML/CSS

Languages:

- French: Native speaker
- English: Fluent (TOEFL 104/120)
- Spanish: Basics

Interests

Sports:

- Competitive CrossFit (active competitor, discipline, teamwork)
- High-level rugby player (French Rugby Federation *pôle espoir*), served as team captain