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Pierre Moreau

PhD in Computer Science · Data Scientist / ML Engineer — AI & Healthcare

Amiens, France | moreau.p.02@gmail.com | 06 11 80 58 32 | pierremoreau.myddns.me
linkedin.com/in/pierre-moreau-phd

Summary

PhD in Computer Science (AI / Machine Learning) specialised in healthcare, bridging applied research and hands-on engineering — from model development to deployment. Skilled in generative AI (LLMs, RAG), multimodal learning and shipping full-stack AI products (FastAPI / Django / Next.js, Docker, self-hosted). I build interpretable, reliable AI with real-world impact.

Skills

Languages: Python, SQL, JavaScript, Dart, Bash, PHP, HTML/CSS

ML & Deep Learning: PyTorch, TensorFlow, Keras, Hugging Face Transformers, scikit-learn, XGBoost

LLMs & Generative AI: Fine-tuning (PEFT, LoRA), RAG (LangChain), prompting, Whisper (speech-to-text), OCR

Vision & NLP: Segmentation (UNetR, SwinUNet), OpenCV, Pillow, NLTK

Data Science: NumPy, Pandas, SciPy, Matplotlib, Seaborn ; PCA, DTW, ANOVA, Chi^2

Engineering & Full-stack: Django, FastAPI, Flask, Next.js / React, Flutter, TypeScript, PostgreSQL / Supabase, Stripe

MLOps & Deployment: Docker, Git / GitHub, REST APIs, self-hosting (Linux / DDNS), GitHub Pages, Google Play Console

Responsible AI: Explainability (SHAP, LIME), bias/fairness analysis, GDPR & AI Act

Tools: Git, Docker, VS Code / Cursor, Jupyter, Claude Code / Codex

Professional Experience

Post-doctoral Researcher — AI & Healthcare, University of Picardie Jules Verne – Amiens . **Sept 2025 – present**

- RAUC project: designing an optimised care pathway for digestive surgical emergencies, integrating AI and e-health, aimed at predicting post-operative complications.

Data & AI Engineer — AI & Data Science Lead (Healthcare), Capgemini Engineering **Mar 2024 – May 2025** – Paris

- Led an AI medical-assistant demonstrator (multimodal), including a dictation-to-document pipeline: voice dictation → Whisper transcription → LLM-generated structured clinical documents (reports, summaries).
- NLP pipelines: OCR of blood-test results and automatic keyword extraction to enrich metadata.
- Fine-tuned LLMs (OpenAI, Mistral) with Hugging Face Transformers and PEFT for clinical summaries and audio transcription.
- Developed a multimodal RAG pipeline (LangChain) synthesising structured and unstructured medical data.
- Applied research on placenta segmentation (UNetR, SwinUNet) to improve accuracy in prenatal imaging.
- Coordinated AI researchers, data scientists and clinicians; project and team management (15-20 people).

Teaching & Research Assistant (ATER), University of Picardie Jules Verne – Amiens . . . . . **Sept 2022 – Aug 2023**

- Tutorials and lab sessions for undergraduates (years 1-3) — PHP, Bash, C, advanced programming.

PhD Candidate — Doctoral Research, University of Picardie Jules Verne – Amiens . . . . . **Sept 2019 – June 2023**

- Research on human motion modelling and analysis (in collaboration with Amiens University Hospital); built a comprehensive motion database.
- Analysis (PCA, Dynamic Time Warping, correlation) and optimisation via genetic algorithms for feature selection.
- Deep learning modelling (RNN, LSTM, CNN, residual networks, FcNN) and SVM; interpretable biomechanical representation using matrix formulations.

IT Engineer / Developer (apprenticeship then permanent), LV Informatique – Amiens . **Sept 2017 – Sept 2019**

- Developed custom ERP software (Lynéade then Lynéa2, WinDev): business processes (accounting, purchasing, sales, inventory, after-sales), SQL database administration, client support and customisation.

Projects

Solis — AI-powered ERP (independent product) **2024 – present**

End-to-end full-stack ERP with a conversational AI assistant; solo-designed, built and self-hosted. Live demo

- Backend Django REST + PostgreSQL / Supabase, frontend Next.js 15; containerised with Docker, self-hosted (Linux).
- AI features: Claude API assistant, Whisper speech-to-text, OCR document scanning.
- Business logic: quotes / invoices, e-invoicing (Factur-X), Stripe billing; GDPR-compliant by design.

Medic — AI-assisted prescriptions POC (Claude + MCP) **2026**

Healthcare POC: generating structured French medical prescriptions from voice dictation (local whisper.cpp) via a Claude agent driving an MCP tool server — regulated PERFADOM / OAH home-care forms, RBAC and drug-interaction checks. Next.js 15 / React 19 / TypeScript, Prisma + SQLite; 100% synthetic data. Archived — it led to Ordo, a narrower, market-focused successor.

Vesta — radiology scheduling (Amiens University Hospital) **2024**

Web app used by a radiologist to auto-generate the department's monthly planning; React / Vite / TypeScript, deployed on GitHub Pages. Live demo · Code

ReapIt — strength-training app (mobile) **2025**

Cross-platform Flutter app with a Supabase back-end (Auth, Postgres/RLS, Realtime, Edge Functions); offline-first logging with cloud sync and a rule-based weekly progression engine. Closed beta on Google Play.

AI-played games — open-source experiments (Python) **2024 – 2025**

Games & artificial life learned from scratch (neuro-evolution NEAT, RL — PPO/DQN, self-play → Nash): Flappy-NEAT · Penalty-AI · Football-AI · Pacman-AI · SpaceInvaders-AI · Snake · Petri-AI.

Education

University of Picardie Jules Verne, PhD in Computer Science — Artificial Intelligence – Amiens **Sept 2019 – June 2023**

- Thesis: analysis of human motion using artificial intelligence tools, in collaboration with Amiens University Hospital.

University of Picardie Jules Verne, MSc in Computer Methods Applied to Business Management (MIAGE) – Amiens **Sept 2017 – June 2019**

University of Picardie Jules Verne, BSc in Computer Methods Applied to Business Management (MIAGE) – Amiens **Sept 2014 – June 2017**

Publications

A Genetic Algorithm-Optimized PID Controller for Robust Tumor Treatment via Combined Immuno-Chemotherapy **2026**

Jérôme Bosche, Consibelle Djiffouo Dzoyim, *Pierre Moreau*
(International Conference on Control, Decision and Information Technologies (CoDIT) — accepted)

Towards Better Placenta Segmentation for Earlier Preeclampsia Detection on 3D Doppler Images **2025**

Charlotte Alliod, Emilien Micard, *Pierre Moreau*, Léo Challier, et al.
(Computerized Medical Imaging and Graphics (CMIG) — submitted)

Two-branch neural network using two data types for human activity recognition **2023**

Pierre Moreau, David Durand, Jérôme Bosche, Michel Lefranc
(IEEE Sensors Journal)

A motion recognition technique based on linear matrix representation to improve Parkinson's disease treatments **2021**

Pierre Moreau, David Durand, Jérôme Bosche, Michel Lefranc
(9th International Conference on Systems and Control (ICSC))

A motion recognition algorithm using polytopic modeling **2020**

Pierre Moreau, David Durand, Jérôme Bosche, Michel Lefranc
(7th International Conference on Control, Decision and Information Technologies (CoDIT))

Certifications

Generative AI with LLMs — DeepLearning.AI & AWS (2024) · Multimodal Search & RAG — DeepLearning.AI (2025)