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PROFILE

MSc candidate at MINES Paris–PSL focused on machine learning for physical simulation. Master's dissertation: neural-network surrogates trained on 32,000 dynamic thermal simulations (72% RMSE reduction over baseline). Interested in ML-accelerated simulation and research software.

PROFESSIONAL EXPERIENCE

MINES Paris-PSL

Paris, France

Research Intern – Data Modelling & Analytics (Energy Systems)

May 2025 – Aug 2025

- Designed Python **ETL workflows** (batch ingestion, transformation, validation) on large-scale simulation datasets in SQL stores.
- Reduced end-to-end processing time by ~60% through vectorized Pandas operations and modular pipeline design.

Tinmar Energy

Bucharest, Romania

Quantitative Analyst Intern

Jul 2024 – Oct 2024

- Architected Python and SQL **data acquisition pipelines** ingesting **90k+ hourly observations across 10+ years** from multiple vendor sources, supporting daily analysis workflows.
- Designed **object-oriented forecasting framework** integrating **ARIMA and ML models** with automated data validation, improving directional prediction accuracy by ~15% over baseline.
- Engineered automated stress-testing and scenario engines for **3 internal models**, quantifying behaviour under extreme market conditions.

Energy Market Analyst

Jun 2023 – Oct 2023

- Built **day-ahead forecasting pipelines** (exponential smoothing, seasonal models) across **4 European wholesale markets**, improving forecast accuracy by ~12%.

EDUCATION

MINES Paris – PSL

Paris, France

Master's of Science in Energy Engineering

Feb 2025 – Dec 2027

- Grade: 16.39/20 (Mention Très Bien); Major: Renewable Energy Integration & Energy Efficiency.
- Strong quantitative focus on optimisation, numerical methods and data-driven modelling of complex physical systems.

Politehnica University of Bucharest

Bucharest, Romania

MSc in Hydroinformatics and Water Engineering | Parallel studies with MINES Paris – PSL

Oct 2024 – Jun 2026

- First-Class Honours (94%). Dissertation (Grade: 100%): **MLP surrogate models for dynamic thermal simulation** – 32,000 Pléiades/COMFIE runs, 72% RMSE reduction with explicit shading descriptors, SHAP interpretability, physically consistent behaviour under renovation scenarios.

Bachelor of Science, Energy Engineering

Oct 2020 – Jul 2024

- First-Class Honours (85.7%); ranked in the top 10% of the cohort.

TRAINING

University of Cambridge – ICCS

Cambridge, UK

ICCS Annual Summer School (Institute of Computing for Climate Science)

Jul 2026

- Differentiable Programming (JAX, Autograd, explicit/implicit Euler schemes); HPC (SLURM); Research Software Engineering practices; Intermediate Git.

PROJECTS

Personal Project

seeingmarkets.com

Seeing Markets – Interactive Visualizations of Electricity Markets

2026

- Self-authored **interactive educational website** teaching how European electricity markets work, inspired by Brown University's *Seeing Theory*; built in **vanilla HTML/CSS/JS** with a scrollytelling architecture.
- Interactive merit-order and social-welfare curves, forecast uncertainty cones, and a **live European zonal price map** updated daily from ENTSO-E data via API.

ENGIE Case Study

Paris, France

Grid Imbalance Sign Prediction (ML, Rigorous Out-of-Sample Validation)

Mar 2026

- Built **end-to-end OOP framework** in Python (data ingestion, feature engineering, model evaluation) over **87k+ 15-min intervals** of grid data, under strict **no-lookahead constraints**.
- Trained Gradient Boosting, Random Forest, and Logistic Regression classifiers to predict grid imbalance sign (74% direction accuracy); validated on **6 months of never-seen out-of-sample data**.

Supervised Project

MINES Paris – PSL

V2G Fleet Dispatch Simulation for Frequency Containment Reserve (FCR)

2026

- Vectorized NumPy/Pandas simulation** of a 150-EV fleet providing FCR, over **real grid frequency data** (France 2019–2021, 10 s resolution); Smart vs Uniform dispatch: efficiency 95% vs 86%.
- Modelled **battery degradation** via Thévenin equivalent circuit and throughput-based cost model, translating physical wear into dispatch-strategy economics.

- Full-stack web app that **matches job descriptions against a library of 31 tailored CVs**: browser-side cosine-similarity pre-filter narrows to 8 candidates, then **LLM re-ranking (Claude API, Python serverless on Vercel)** selects a top 3 with structured edit suggestions.

SKILLS

Scientific Computing & ML: Neural networks and surrogate modelling (Keras/TensorFlow); JAX, Autograd, automatic differentiation; gradient boosting (scikit-learn); SHAP interpretability; numerical methods for ODEs

Software Engineering & HPC: Python (NumPy, Pandas, Matplotlib, Plotly), Git (branching, interactive staging), SLURM, Linux/Bash, conda environments, Ruff/linting, SQL, FastAPI, Docker; ETL pipelines and large-scale data processing

Domain Knowledge: Building energy simulation (Pléiades/COMFIE); European power systems and markets; renewable energy integration; settlement & imbalance mechanisms

Languages: Romanian (Native), English (C2), French (B2)