Adelowo Adebanji Oluwatimileyin

Data Scientist · Machine Learning Engineer · Applied Mathematician
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PROFILE

Applied Mathematician and Data Scientist with **3+ years** of professional experience building predictive models, operational analytics, signal-processing pipelines, and production ML services. Combines strong foundations in mathematical modeling, optimization, numerical methods, and statistics with hands-on experience in Python, SQL, PyTorch, scikit-learn, FastAPI, and Docker. Additional project work spans LLM systems, scientific machine learning, computer vision, and computational modeling.

PROFESSIONAL EXPERIENCE

Dec 2024 – Dec 2026

Data Scientist | *Intuos Srl*, L'Aquila, Italy

- Develop aircraft flight-phase classifiers from operational telemetry; F1 score of **0.98** on an evaluation set.
- Develop FFT-based audio signal-processing pipelines to analyze aircraft-engine recordings in the frequency domain, identify dominant frequency components, estimate engine RPM, and infer engine operating state across **1,500** telemetry/audio samples; validated RPM estimates against ground-truth measurements, achieving $\boldsymbol{R^2 = 0.80}$.
- Build automated flight-telemetry workflows with a reported **30%** processing-speed improvement and **80%** less manual data preparation.
- Deliver REST APIs and a full-stack dashboard exposing model predictions and engineering metrics; over **200 users**.

Apr 2023 – Nov 2024

Machine Learning Engineer | *N-and Italia Srl*, Italy

- Developed delivery-failure prediction models using over **5 million** transaction records from approximately **150** vending machines, with reported F1 of **0.85**.
- Analyzed transactional and telemetry patterns to investigate vending-machine reliability and operational failure drivers.
- Built ETL and KPI-monitoring workflows with reported **85%** faster reporting and monitoring coverage of over **1 million** transaction records.

Jan 2023 – Mar 2023

Operational Data Analyst | *eResult Srl*, Cesena, Italy

- Optimized SQL queries, reporting **45%** faster execution, and automated recurring business-intelligence workflows.
- Transformed operational data into reproducible KPI reports, with a reported **75%** reduction in reporting effort.
- Built automated, customized customer relationship management (CRM) platforms using SQL and Omniaplace, its integrated software development platform, tailoring workflows and features for operational performance, efficiency, and versatility.

Apr 2022 – Oct 2022

Digital Engineering Intern | *Bridgestone EMIA*, Rome, Italy

- Developed computational-geometry algorithms, including closest-point algorithms for cubic Bézier curves, and improved data structures for tire cross-section simulation and finite-element meshing, with a reported **20%** computational speed improvement.

May 2022 – Aug 2022

Machine Learning Intern | *Fellowship.AI*, Remote

- Integrated an existing InsetGAN-based whole-body image-generation pipeline and built FastAPI inference for iOS integration; reported evaluation on **500** generated samples and **2.3-second** inference latency.

TECHNICAL SKILLS

Programming and data: Python, SQL, C++, MATLAB, JavaScript, NumPy, SciPy, Pandas, PostgreSQL, IBM DB2
Machine learning: PyTorch, TensorFlow, scikit-learn, LightGBM, supervised learning, deep learning, feature engineering, model evaluation, time-series and signal processing
LLM and generative AI: LLMs, RAG, LangChain, OpenAI APIs, ChromaDB, NL-to-SQL, prompt engineering, embeddings, vector search
Engineering and MLOps: FastAPI, Docker, MLflow, Apache Spark, Databricks, Git/GitHub, ETL/data pipelines, REST APIs, AWS, Kubernetes, Terraform
Scientific computing: numerical methods, optimization, finite-element and pseudo-spectral methods, computational modeling, PDEs

SELECTED PROFESSIONAL PROJECTS

INTUOS Flight Data Monitoring Dashboard
- Built a full-stack platform using FastAPI, IBM DB2, React/Vite, and Docker for query-on-demand analysis of recorded flight telemetry.
- Integrated ML-based flight-phase predictions and deterministic safety alarms for internal flight-performance analysis at Intuos Srl.

Aircraft Engine Monitoring via Audio DSP
- Built FFT-based RPM and engine-status estimation on a Raspberry Pi, transmitting results over UART to an ESP32.
- Tested on Tecnam P92 / Rotax 912 recordings and analysed harmonic-order ambiguity; reported validation against tachometer measurements ($\boldsymbol{R^2 = 0.80}$).

INDEPENDENT RESEARCH PROJECTS

Applied Mathematics & Scientific Machine Learning Jan 2026 – Present

Develop and verify numerical solvers and ML surrogates using convergence studies, analytical solutions, gradient checks, and held-out experiments. Study model accuracy, runtime, and generalisation in PDE simulation and computational imaging.

Optimal Mixing of Passive Scalars
- Derived and implemented the Lin–Thiffeault–Doering scheme in a pseudo-spectral Python solver, reproducing the original thesis tables.
- Extended the resolution study to $\boldsymbol{N = 512}$ with **48** verification tests; identified changing fit windows as the main cause of apparent exponent dependence, with approximately second-order convergence on fixed windows.

Burgers' Equation: ROM/FNO Comparison
- Compared POD–Galerkin models, DEIM hyper-reduction, MLP, and Fourier Neural Operator surrogates against a pseudo-spectral solver.
- Across **40** in-distribution cases, POD-ROM achieved **0.152%** relative L^2 error versus **0.90%** for FNO (**five seeds**); on unseen initial conditions, FNO error was **22.6%** versus **1.69%** for POD-ROM.

Photoacoustic Reconstruction: Model-Based vs. Learned Inversion
- Built a synthetic sparse-view imaging pipeline comparing time reversal, Tikhonov inversion, and learned reconstruction in PyTorch.
- Across **400** held-out images and **five** U-Net seeds, refinement improved PSNR by **4.9 dB** (**16 sensors**) and **3.2 dB** (**64 sensors**) over calibrated time reversal; studied sound-speed mismatch and distribution shift.

GENERATIVE AI PROJECTS

LLM Engineering Portfolio
- Implemented Medical RAG, Enterprise NL-to-SQL, and FinBERT pruning/distillation pipelines within a **nine-project** portfolio.
- Compressed FinBERT by **20%** (**110M to 88M** parameters); distillation recovered accuracy lost through layer dropping, with evaluation limitations due to likely test/training overlap.

EDUCATION

2018 – 2021 **M.Sc. Mathematical Engineering** | University of L'Aquila, Italy
Thesis: *Bounds on Mixing of Passive Scalars Advected by Incompressible Energy- and Enstrophy-Constrained Flows and Anomalous Dissipation.*
Relevant study: machine learning, scientific computing, optimization, numerical analysis, finite-element methods, and PDEs.

2013 – 2018 **B.Sc. Mathematics** | Obafemi Awolowo University, Nigeria
Thesis: *Application of Galerkin Finite Element Method to the One-Dimensional Stefan Problem.*

CERTIFICATIONS

IBM Data Science Professional Certificate (IBM / Coursera, 2020); Machine Learning (Stanford University / Coursera, 2020).

SELECTED AWARDS

Professor S.S. Okoya Prize for Excellence in Applied Mathematics (2018); University of L'Aquila International Scholarship (2018–2021).

LEADERSHIP

Leadership: Founder and President, Inter-University Mathematics Club (2016–2018); Academic Director and peer tutor, NAMSS, Obafemi Awolowo University (2015–2018).