

IMAD EDDINE EL MOUSS

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PROFILE

AI & data engineering student building end-to-end ML systems, from data pipelines to deployed models. I design experiments, run careful evaluations, and ship usable AI features. Hands-on with PyTorch/TensorFlow, LLM tooling, streaming/real-time data, and modern web stacks.

EXPERIENCE

Data Engineering Intern – AIS Autonomous & Intelligent Systems Laboratory (TUAS)

Feb – May 2025

- Built an end-to-end data pipeline for real-time water metrics, tuned Telegraf configurations to reduce processing latency by **40%** and deploying Grafana dashboards that ran at **99.9%** uptime.
- Designed microservices for the TSIRP Data Platform, integrated Apache Pulsar to reduce response times by **~60%**; scaled PostgreSQL with PostGIS/Citus
- Added ML models for anomaly detection, forecasting, and classification and automated data quality/authentication workflows using Keycloak, keeping datasets **>98%** accurate.

Applied AI Intern – THRIVE EU Project, CoRe Research Lab (TUAS)

April – August 2025

- Prototyped an LLM-based multi-source information extraction system (Mistral via llama-cpp, Whisper, EasyOCR...) with API + Streamlit UI.
- Wrote the platform's technical blueprint (data hub, harmonisation, governance) and technical documentations, architecture diagrams and a roadmap; collaborated across work packages to integrate requirements and hand off results & components.

Founder & Lead Developer – SisuSpeak (AI Finnish Language Learning Platform)

June 2025 – Present

- Built a full-stack app (Next.js, Tailwind, Supabase) and an AI pipeline for conversation + STT/TTS; iterated via user feedback to improve retention and UX.
- Coordinated with Boost Turku Incubator to refine the business model and platform architecture.

PROJECTS & RESEARCH

NaviCast – Maritime Traffic Intelligence Platform | Python, FastAPI, PostgreSQL, ML, MQTT, Leaflet

- Ingested AIS data via MQTT, stored messages in PostgreSQL and exposed real-time vessel tracking and query APIs; built an interactive web map with filters and dark/light modes.
- Trained Random Forest models on **~363 k** AIS records to predict vessel positions **30 minutes** ahead, achieving mean error of **≈154 meters** and median error **≈11 meters**, enabling accurate short-term trajectory forecasting.
- Designed a microservices architecture separating data collection, prediction, API and visualisation components.

Spotify AI Music Recommendation Engine | Python, Scikit-learn, Flask, React

- Processed **1.1 million** tracks; PCA (preserving ~92% variance) + K-means (k=35 categories); REST API + UI delivering sub-second recommendations.

Security in Federated Learning – Privacy-Preserving Benchmarking | PyTorch, TenSEAL, Federated Learning (ongoing)

- FL privacy benchmark: capture per-client updates, run Breaching, and report PSNR/SSIM (\pm LPIPS) + accuracy across models, non-IID splits, and selective-layer HE (TenSEAL).
- Added defenses (noise “confusion”, clipping, RDP accountant) and a reproducible runner (configs, JSONL/MLflow, artifacts).

EDUCATION

B. Eng. in ICT (Data Engineering & AI) – Turku University of Applied Sciences

2023 – Present, Turku

- **Coursework:** Big Data Eng; Cloud; Data Analytics & ML; Deep Learning; Linear Algebra; Prob & Stats; NLP; CV; MLOps.
- **Thesis:** *Structured Procedural Knowledge Extraction from Industrial Documentation Using Large Language Models* – developing an LLM-based system to transform unstructured industrial documents into machine-readable **procedural knowledge graphs**. The research focuses on preserving conditional logic, sequential steps, equipment-action relationships and contextual constraints, and compares a baseline flat entity extractor with a structured extraction pipeline using prompt engineering and schema design.
- **Winner** of the Boost Turku Startup Marathon hackathon.
- **Startup Journey Accelerator**, Boost Turku - Summer 2025: 8-week cohort; mentoring, prototyping, customer discovery and pitching.

TECHNICAL SKILLS

Data/ML: PyTorch, TensorFlow, scikit-learn, Spark, Airflow • **Programming/APIs:** Python, SQL, FastAPI/Flask • **Data:** PostgreSQL/Citus, InfluxDB • **Streaming/Infra:** Pulsar, MQTT, Kafka, Docker, Git • **LLM/NLP:** llama-cpp, Whisper, OCR • **Viz:** Grafana, Plotly/Matplotlib...

CERTIFICATIONS & COURSES

- **AWS Academy:** Cloud Foundations + Machine Learning Foundations + Machine Learning for Natural Language Processing.
- MATLAB Onramp + MATLAB Fundamentals.
- DataCamp **Certified Data Engineer**.

LANGUAGES

English, French, Arabic (native/professional proficiency), Finnish (A2 – official YKI test).