

Gerrit Schimmelpenninck Mosse

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PROFILE

Machine learning and data engineer for physical systems. At Albatros Digital, a maritime performance SaaS, I build the pipeline that turns vessel telemetry and metocean data into calibrated power and fuel predictions: multi-vendor ingestion, physics-hybrid neural models, and the evaluation framework behind them. I work at the layer where research becomes tested, reproducible, customer-facing software.

EXPERIENCE

Working Student, Data & Tech Innovation — Albatros Digital, Rotterdam · Jan 2026 – present

Ship-performance SaaS: physics API plus ML calibration for fuel and emissions. Reporting to the chief scientist (TU Delft PhD) and the technical owner.

- **Vessel data pipeline.** Built core stages of the company's central pipeline: multi-vendor sensor ingestion, measured-column derivation via expression-tree formulas, custom derived columns, and timestamp-aware position resampling, adopted by the technical owner as the pipeline default. Shipped a six-stage no-code application that takes a raw voyage dataset through parallel physics simulation, ML correction and an interactive dashboard to customer fuel tables.
- **Physics-hybrid transformer.** Designed and trained a PyTorch model that wraps a Holtrop-Mennen resistance simulation and learns the residual, substantially reducing shaft-power error against the physics baseline on condition-stratified, voyage-level held-out data.
- **Evaluation framework.** Authored the team's evaluation standard: voyage-level holdouts, autocorrelation-aware splits, leakage checks, MLflow tracking, model cards and benchmarks.
- **Metocean and routing engines.** Built a multi-provider hindcast weather pipeline (ERA5, Copernicus Marine, MET Norway, Open-Meteo) delivering conditions along AIS tracks into a canonical, hive-partitioned Parquet schema, and a headless sea-route generator (graph routing, land masks, kinematics) that emits pipeline-ready voyages and GeoJSON for the company API.
- **Digital-twin visualisation.** On own initiative, built a photorealistic Unreal Engine 5 voyage simulator (Blender to UE5) showing measured, predicted and API power side by side along real routes and weather, now used in customer demos.
- **Fleet fouling study.** Ran hull-fouling detection across a fleet of sister vessels: clean-state baselines, pooled MLP drift monitoring, hull-versus-propeller attribution.

SELECTED INDEPENDENT PROJECTS

- **AIS Vessel Tracking Dashboard** — gerritsxd.com/ships. Live AIS ingestion, real-time socket updates, global visualisation, self-hosted on a Linux VPS with Nginx and systemd.
- **TATA, 3D informative website** — tata.gerritsxd.com. Interactive 3D environment for spatial data storytelling.
- **Quantum-inspired neural network interpretability** — reflection-based probing of hidden activations with PyTorch and Qiskit.

SKILLS

- **ML:** PyTorch, transformers for time-series regression, physics-informed and hybrid models, scikit-learn, MLflow, leakage control and time-series-aware validation.
- **Data engineering:** pandas, PyArrow and Parquet, hive partitioning, pydantic schemas, heterogeneous time-series ingestion and resampling, pytest.
- **APIs and apps:** FastAPI, GraphQL clients, REST, WebSockets, Streamlit, Plotly, Svelte.
- **Geospatial and simulation:** searoute, shapely and pyproj, Holtrop-Mennen resistance modelling, metocean data, Blender, Unreal Engine 5.
- **Systems:** Linux, VPS administration, Nginx, systemd, SSL/TLS, Git and PR workflow.
- **Languages:** English (fluent), Spanish (native), Dutch (B1).

EDUCATION

- **BSc Computational Social Science — University of Amsterdam** · 2024 – present. Third year; internship semester Sept–Dec 2026 at Albatros Digital (12 EC).
- **BSc Artificial Intelligence — Vrije Universiteit Amsterdam** · 2021 – 2022. First year, transferred.

REFERENCE

Dr. Nico van der Kolk, Chief Scientist, Albatros Digital. Available on request.