Alexey Belochenko *Senior Software & Data Engineer*

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PROFILE

Senior Software & Data Engineer with a rigorous foundation in Applied Mathematics and a proven track record in the Canadian market. I specialize in architecting comprehensive data ecosystems and cloud-native platforms that bridge the gap between complex R&D initiatives and production-grade reliability. My expertise encompasses the entire engineering lifecycle - from designing high-throughput ingestion systems and optimized processing pipelines to orchestrating scalable MLOps infrastructure and automated CI/CD workflows. I apply a fundamental scientific approach to deliver robust, high-performance solutions for high-stakes environments where analytical precision meets enterprise-grade scalability.

WORK EXPERIENCE

Sofware Developer (Consultant), *GE Vernova*   Aug 2024 – Dec 2025 | Barcelona, Spain
- **Wind Resource Assessment (WRA) Engineering:** Developed and maintained a proprietary Python ecosystem for complex meteorological analysis, utilizing **NumPy** for vectorized operations and broadcasting to process SODAR (Sonic Detection and Ranging) and meteorological mast data.
- **Mathematical Modeling:** Implemented advanced time-series processing techniques, including **detrending** and **temporal decomposition**, to analyze air mass density stability and hub/mast positioning for wind turbine deployment.
- **Infrastructure Optimization:** Refactored critical Airflow DAGs using vectorized algorithms, achieving a 5× to 10× acceleration in task execution and significantly increasing pipeline reliability.
- **LLM-Driven Migration:** Spearheaded the migration of 4+ core services to Python 3.1x, developing custom LLM-based static analysis scripts to automate type-hinting, signature refactoring, and dependency resolution (UV/Ruff integration).
- **Observability:** Architected a monitoring stack (Grafana, Loki, Prometheus), reducing incident resolution time by enabling real-time tracking of GPU-accelerated Kubernetes clusters.

Data Engineer Consultant, *Trialing Health S.L*   Dec 2023 – Aug 2024 | Barcelona, Spain
- **Infrastructure & Latency Optimization:** Spearheaded the setup of an **AWS S3-based Data Lake** and optimized Airflow-orchestrated ETL pipelines, achieving a 67% reduction in data-to-insight latency (from 120 to 40 minutes).
- **Quality Assurance & Data Stewardship:** Architected a multi-tier validation framework featuring a specialized **Quarantine Zone** for manual data verification; this ensured strict data integrity and facilitated seamless collaboration between engineers and Data Managers.
- **Complex Data Structuring:** Engineered a robust ingestion engine using **Regex** and **Pydantic** to transform heterogeneous, non-standardized scientific records into a high-fidelity schema, enabling physicians to track drug efficacy and treatment outcomes in real-time.
- **Clinical Intelligence Centralization:** Designed and deployed a unified medical data platform that aggregated unstructured research archives from hundreds of hospitals and clinical centers across Spain and Portugal.

DevOps and MLOps Consultant, *Lemay.ai (Canadian Experience)*   Dec 2022 – May 2023 | Toronto, Canada
- **Scalable ML Architecture:** Deployed a fault-tolerant microservices architecture on **Kubernetes (EKS)** for high-load ML model serving; implemented elastic scaling mechanisms that enabled seamless handling of peak AI application demands.
- **DevOps Standardization:** Engineered and standardized enterprise-grade **CI/CD pipelines using GitLab**, automating end-to-end model training and validation workflows to slash time-to-production.
- **Data Processing:** Developed high-throughput pipelines integrating **AWS Rekognition and Textract**, increasing data extraction accuracy by 40% and optimizing PostgreSQL schemas for complex analytics.

Co-Founder & R&D Lead, *Elliscope*   Jul 2019 – Mar 2022
*Founded an R&D venture focused on autonomous aerial systems and hybrid energy solutions. Represented the project at **WebSummit 2021**. https://elliscope.zeelex.me/* ⧉
- **Strategic R&D Leadership:** Directed a multi-disciplinary venture focused on the feasibility of autonomous hybrid-energy airships; managed outsourced teams specializing in aerodynamic modeling, 3D-prototyping, and geometric optimization.
- **Hydrogen Energy Systems:** Conducted extensive research into **Hydrogen Fuel Cell** integration and energy storage systems ; modeled energy balance equations to achieve a theoretical flight endurance of 5+ weeks, identifying critical lift-to-weight constraints for zero-emission propulsion.
- **Advanced Control Systems:** Performed theoretical assessments of aircraft controllability across diverse atmospheric profiles ; developed adaptive control algorithms utilizing **Kalman Filters** and **Model Predictive Control (MPC)** to compensate for non-linear turbulence and buoyancy loss at altitudes of 10–12km.

- **Remote Sensing & Market Analysis:** Evaluated the deployment of multispectral imaging systems for precision agriculture ; conducted a comprehensive cost-benefit analysis against satellite-based infrastructure, leading to a strategic pivot based on capital expenditure (CAPEX) efficiency.
- **Prototyping & Validation:** Designed and tested scale-model demonstrators to validate engineering hypotheses regarding stability and sensor integration; published technical findings and white papers within the Ukrainian Space Association.

Senior Data & MLOps Consultant (Project-based),   Jul 2021 – Aug 2023
Independent Contractor (DataArt, Inmost, Virtuace)
Delivered critical infrastructure upgrades and ML solutions for international tech clients, focusing on cloud migration and high-load systems.
- **Infrastructure Resilience & Cost:** Implemented a Disaster Recovery plan on **AWS EDR** ensuring **99% availability**, and optimized cloud resource allocation (S3/Lambda) to reduce data storage and processing costs by **15–25%**.
- **Intelligent Data Processing:** Engineered high-throughput pipelines integrating **Computer Vision** and **NLP** (AWS Rekognition/Textract), increasing data extraction accuracy by **40%** and boosting analytics throughput.
- **Architecture Modernization:** Orchestrated on-premise to cloud migrations and optimized **PostgreSQL** schemas for aggregation, achieving a **10% increase** in analytics efficiency and standardizing CI/CD workflows.

Backend Engineer (ML Infrastructure), *Sembly AI*   Oct 2019 – Jul 2021 | Odesa, Ukraine
- Established end-to-end automated training and validation workflows, cutting model time-to-production by **50%** and standardizing deployment cycles.
- Architected a high-throughput audio ingestion system using **Apache Kafka**, enabling real-time processing and driving a **30% improvement** in system **responsiveness.**
- Overhauled NLP inference pipelines, achieving a **25% speed boost** and a **15% increase in model**
- Decoupled the monolithic AI platform into fault-tolerant microservices, enhancing system resilience and slashing deployment latency by **40%**.

EDUCATION

MSc in Modeling for Science and Engineering,   2025 | Barcelona, Spain
Universidade Autónoma de Barcelona (UAB)
Focus: Mathematical modeling, Dynamical Systems and Complexity, High-Performance Computing (HPC)

Bachelor's Degree in Applied Mathematics and Computing,   2019 – 2023 | Odesa, Ukraine
Odessa I.I.Mechnikov National University
Focus: Numerical Methods, Optimization and Control Theory, Machine Learning, Econometrics

SKILLS

Mathematical Modeling & HPC — Numerical Methods ｜ Optimization & Control Theory ｜ High-Performance Computing (HPC) ｜ Time-Series Analysis ｜ Vectorized Algorithms ｜ Dynamical Systems.

Data Engineering & Orchestration — Apache Airflow ｜ Celery ｜ Apache Spark ｜ Kafka ｜ DBT ｜ Data Lakes (Iceberg/Delta)

Cloud & DevOps — **AWS** (S3, Lambda, EC2, EKS, Glue) ｜ Kubernetes ｜ Docker ｜ Terraform ｜ Helm ｜ GitHub+GitLab CI/CD

Programming Languages — **Expert**: Python ｜ **Competent**: C/C++, Rust, Java ｜ **Amateur**: Golang

Machine Learning & AI — MLflow ｜ TensorFlow ｜ PyTorch ｜ Scikit-learn ｜ Natural Language Processing (NLP) ｜ NumPy ｜ Pandas ｜ LangChain ｜ DSPy

Observability — Prometheus ｜ Grafana ｜ Loki ｜ Promtail

Back-end & Databases — FastAPI ｜ Flask ｜ Django ｜ Django Rest Framework ｜ ClickHouse/Apache Doris ｜ PostgreSQL ｜ MySQL ｜ MongoDB