

Alexandre Cotorobai

Software Engineer

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Software Engineer focused on backend development, AI, data systems, and full-stack applications. Experience working in multidisciplinary teams delivering production-ready software systems. Co-author of 6 research papers in federated/machine learning and software systems. Currently contributing to the GREG project at IEETA.

Experience

Full Stack Developer and Researcher **September 2024 – Present**
IEETA *Portugal*

- Building a full-stack governance application to serve the GREG community, delivering a control plane for federated OHDSI/OMOP studies with approvals, execution tracking, and auditability.
- Developing an SOP authoring tool for the EU GREG project, integrating LLMs to automate the user experience and generate complete, ICH-GCP compliant documents from predefined templates.
- Developed a federated learning infrastructure using PySyft to train tree-based ML models on distributed datasets, achieving accuracy within 10% of centralized training while preserving data privacy. Available at: *fed-rf-mk*.

Teaching Assistant **February 2026 – June 2026**
University of Aveiro *Portugal*

- Guided 6 development teams (24 members) in architecting and implementing robust Spring Boot backend applications, enforcing strict software design patterns, clean code principles, and agile best practices.
- Supporting Software Engineering (IES) classes, guiding students on design, implementation, and best practices.

Data Engineer Intern **August 2024 – September 2024**
DataLinks Inc. *Switzerland*

- Built PySpark pipelines to process 20+ years of SEC data, doubling dataset size via XML parsing and data extraction.
- Developed a RAG API using LLaMA 3.1 and OpenAI models (in Scala), improving internal workflows and contributing to a five-figure enterprise contract.

Backend Software Developer **October 2021 – June 2024**
Núcleo de Estudantes de Informática *Aveiro, Portugal*

- Refactored and modernized a PHP legacy backend system using FastAPI and PostgreSQL, transforming an unmaintainable codebase into a stable platform still running 5 years later.

Projects

Trailblazer | *FastAPI, PostgreSQL, MongoDB, ElasticSearch, RabbitMQ, ML* **February 2024 – June 2024**

- Designed the backend for a tourist Destination Management System (DMS) under Portugal's PRR "ATT Agenda" in a 6-person Agile team.
- Integrated ML-based recommendation features to support data-driven decision making.

Veterinary App | *Java, Spring Boot, JUnit, Mockito, Selenium, SonarCloud, CI/CD* **May 2024 – June 2024**

- Designed a platform for managing appointments and admissions in veterinary clinics using Spring Boot.
- Developed the product concept, requirements, implemented multiple tests, CI/CD and followed Agile methodologies.

Education

University of Aveiro **September 2024 – June 2026**
MSc in Computer Science and Engineering [Grade: 17.5/20] *Aveiro, Portugal*

University of Aveiro **October 2021 – June 2024**
BSc in Computer Science and Engineering [Grade: 16.2/20] *Aveiro, Portugal*

Major Publications

- **IEEE CBMS 2026, Cyprus** (accepted): "An AI-Driven Document Builder for Standardized Clinical Studies"
- **EFMI MIE 2026, Italy** (accepted): "A Web Assistant for Risk Analysis Reliability in Observational Studies"
- **IEEE CBMS 2025, Madrid** (published): "Federated Random Forest Solution for Secure Distributed ML"
- **IEEE Access** (under review): "Privacy-Aware Federated Tree Models for Secure and Interpretable Machine Learning"

Technical Skills

Languages: Python, Java, SQL, JavaScript, C
Frameworks & Technologies: FastAPI, Flask, Spring Boot, JUnit, Selenium
Data & Systems: PostgreSQL, MongoDB, Redis, MySQL, Neo4j, Kafka, RabbitMQ
Tools: Docker, Git, Maven, Linux, Jira, CI/CD, SonarQube