



# Leonardo Almeida

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## Summary

Master's degree in Computer Science and Engineering, passionate about DevOps, software development and machine learning. My motivation comes from tackling complex technical challenges, applying a meticulous mindset to ensure high quality solutions. I am a dedicated professional who takes commitments seriously, genuinely enjoys the technical process, and is constantly seeking opportunities to learn, contribute, and make a meaningful impact. Further details in my [Portfolio](#).

## Skills

**Programming Languages:** Python, C/C++, Java, JavaScript and TypeScript

**CI/CD & Cloud:** Git, GitHub Actions, Docker, Kubernetes, Proxmox, Terraform, AWS, Google Cloud and Cloudflare

**Full Stack:** Django, FastAPI, Spring Boot, React, Svelte, Angular, HTML and CSS

**Machine Learning & Data Science:** TensorFlow, Keras, PyTorch, OpenCV, NumPy, Pandas and Scikit-learn

**Data & Messaging:** PostgreSQL, MySQL, Redis, MongoDB, RabbitMQ, Kafka, MQTT, MPI and Zenoh

**Languages:** Fluent in Portuguese and English

## Experience

**Researcher**, University of Aveiro and Instituto de Telecomunicações Sept 2023 – Aug 2025

- Designed and configured a multi-VM environment for running distributed FL experiments across multiple workers
- Co-authored 9 research papers for peer-reviewed conferences and journals
- Developed [FlexFL](#), a Modular and Resilient FL Framework for my [MSc dissertation](#) with:
  - Fault-tolerant execution, workers can leave or join the network without halting training
  - Optimized the model aggregation to reduce memory usage and improved training time by overlapping processes
  - Implemented a dynamic argument parser that auto-discovers new classes, extracts arguments and their types through Python AST analysis, and improves memory usage and startup time by importing only what is necessary
- Tech Stack:** Python, Proxmox, TensorFlow, Pytorch, Keras, Pandas, NumPy, MPI, Kafka, MQTT and Zenoh

## Education

**MSc Computer Science and Engineering** - University of Aveiro, Grade: 18/20 Sept 2023 – July 2025

**BSc Computer Science and Engineering** - University of Aveiro, Grade: 17/20 Sept 2020 – July 2023

## Projects

**NoteAlly - Students and Educators note sharing platform**

[Repositories](#)

Microservices-based web platform designed to facilitate the exchange of academic resources.

- Gamified "Karma" ranking system and monetization options for user engagement, developed with Agile methodologies.
- Microservices platform with 5 distinct services, deployed using Docker on AWS ECS Fargate for scalability.
- Comprehensive AWS infrastructure, including RDS, S3, API Gateway, Cognito, VPC, and Network Load Balancer.
- Tech Stack:** Docker, GitHub Actions, AWS, Terraform, Python, Django, Svelte, JavaScript, and PostgreSQL

**Wesago - Modern online forum**

[Repository](#)

Robust Kubernetes deployment of the Misago forum, including a static project website.

- High availability with PostgreSQL master-slave replication, Redis Sentinels, and PodAntiAffinity across nodes.
- Automated deployment process, Horizontal Pod Autoscaling based on CPU utilization, and Liveness Probes for auto-healing.
- Centralized logging via Rsyslog, monitoring with Prometheus and Grafana, and a defined Disaster Recovery plan.
- Tech Stack:** Docker, Kubernetes, Python, Django, React, JavaScript, PostgreSQL and Redis

**PickAPoint & PrintPlate - E-commerce deliveries and e-store platforms**

[Repositories](#)

Web-based platforms that enable businesses to register as collection points and e-stores to manage orders and track status.

- CI/CD pipeline to deploy dockerized services on Google Cloud, integrated with Twilio API for SMS notifications.
- Robust Quality Assurance with SonarCloud, Test Driven Development, and JMeter performance tests.
- Tech Stack:** Docker, GitHub Actions, Google Cloud, Java, Spring Boot, Svelte, JavaScript and PostgreSQL

## MepML - ML/AI Model Evaluation Platform [↗](#)

[Repositories](#) [↗](#)

Bachelor's final project, a web-based platform designed for ML model evaluation, enabling university professors to create and manage ML exercises and students to submit models, receive immediate performance feedback, and compare results.

- Modern, responsive, and user-friendly interface, featuring a markdown editor, file previews, and Slack bot notifications.
- Multi-layered architecture with frontend, backend (REST API), authentication (Firebase), storage, database and a secure sandbox environment for executing custom Python-based evaluation metrics.
- CI/CD pipeline with GitHub Actions for automated testing, building, and deployment to Google Cloud and Cloudflare.
- **Tech Stack:** Docker, GitHub Actions, Google Cloud, Cloudflare, Python, Django, FastAPI, React, JavaScript and MySQL

## LogiPack - Transport Management System [↗](#)

[Repository](#) [↗](#)

A logistics management system designed for distributors, transporters, and clients, featuring the complete delivery lifecycle.

- Secure token-based authentication with Spring Security and OAuth2, utilizing JWTs for information transmission.
- Multi-layered architecture and dockerized application with a CI/CD pipeline managed by GitHub Actions to production VMs.
- **Tech Stack:** Docker, GitHub Actions, Python, Java, Spring Boot, React, JavaScript, PostgreSQL, MongoDB and RabbitMQ

## Awards & Certifications ---

### Hackathon - Aveiro TechWeek 2024 [↗](#)

Oct 2024

My team won the 5000€ Altice Labs challenge "MEDIA DIVE" by developing a [personalized TV interaction system](#) [↗](#) using enriched metadata and large language models for a user-profile-driven TV experience with transcript-based summaries.

### AWS Academy Graduate [↗](#)

Nov 2023

Successfully showcased foundational knowledge of AWS cloud architecture, core services, security, and cloud economics.

### Think Twice 4th edition - University of Aveiro [↗](#)

Mar 2022

My team won the algorithmic category by solving competitive programming challenges under time constraints.

### Merit Scholarship - University of Aveiro [↗](#)

Nov 2020

Awarded for entering Higher Education with an admission grade of 175/200 or higher, specifically 189.5/200.

## Publications ---

### Federated Learning for a Dynamic Edge: A Modular and Resilient Approach [↗](#)

June 2025

Leonardo Almeida, Rafael Teixeira, Gabriele Baldoni, Mário Antunes, Rui Luis Aguiar

[10.3390/s25123812](#) [↗](#) - MDPI - Sensors

### Efficient training: Federated learning cost analysis [↗](#)

May 2025

Rafael Teixeira, Leonardo Almeida, Mário Antunes, Diogo Gomes, Rui L. Aguiar

[10.1016/j.bdr.2025.100510](#) [↗](#) - Big Data Research

### Privacy-Preserving Defense: Intrusion Detection in IoT using Federated Learning [↗](#)

June 2024

Leonardo Almeida, Pedro Rodrigues, Rafael Teixeira, Mário Antunes, Rui L. Aguiar

[10.1109/melecon56669.2024.10608461](#) [↗](#) - 2024 IEEE 22nd Mediterranean Electrotechnical Conference (MELECON)

### Shallow vs. Deep Learning: Prioritizing Efficiency in Next Generation Networks [↗](#)

Aug 2024

Rafael Teixeira, Leonardo Almeida, Pedro Rodrigues, Mário Antunes, Diogo Gomes, Rui L. Aguiar

[10.1109/ficloud62933.2024.00055](#) [↗](#) - International Conference on Future Internet of Things and Cloud (FiCloud 2024)

### AI Detx: Compression-Based Method for Identification of Machine-Learning Generated Text [↗](#)

Mar 2025

Leonardo Almeida, Pedro Rodrigues, Diogo Magalhães, Armando J. Pinho, Diogo Pratas

[10.1109/dcc62719.2025.00046](#) [↗](#) - 2025 Data Compression Conference