

# Leonardo Almeida

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## Summary

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## Skills

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

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

**Tech Stack:** React, Svelte, Django, FastAPI, Spring Boot, Angular, PostgreSQL, Redis, MongoDB, Kafka, MQTT, TensorFlow, Keras, PyTorch, OpenCV, NumPy, Pandas and Scikit-learn

**Languages:** Fluent in Portuguese and English

## Experience

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

- 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:
  - Multiple ML backends, datasets, ML models, communication protocols and FL algorithms
  - 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, UV, PyPI, Proxmox, TensorFlow, Pytorch, Keras, Pandas, NumPy, MPI, Kafka, MQTT and Zenoh

## Education

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**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

## Other Projects

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**Example Project** [🔗](#) Sept 2023

Example summary

- **Tech Stack:** Python, Django, React

## Awards & Certifications

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**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.

**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.

## Publications

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**Federated Learning for a Dynamic Edge: A Modular and Resilient Approach** [🔗](#) June 2025

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

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

May 2025

Rafael Teixeira, Leonardo Almeida, Mário Antunes, Diogo Gomes, Rui Luis Aguiar