# Alex Quiroga Jaldín

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## PROFILE

MSc in Aerospace Engineering with over 3 years of experience using Python and machine learning libraries such as Scikit-learn, PyTorch, and Keras. Worked on time-series classification, natural language processing, and computer vision projects, with practical experience in web development using Flask.

## SKILLS

**Programming**: Python, NumPy, Pandas, Scikit-Learn, Keras, PyTorch, HTML/CSS, Flask, SQL, C/C++, Bash, Docker
**Machine Learning**: Decision Trees, Deep Learning, Computer Vision, Natural Language Processing, Time-series forecasting
**Certifications**: Artificial Intelligence for Aeroespace Engineering (UPM), Harvard CS50 Introduction to Computer Science (edX)
**Languages**: Spanish, English (C1 Reading and Listening – Linguaskill)

## EXPERIENCE

**Data Scientist Intern** Apr. 2025 – Jul. 2025
***Kerox Technology*** *Madrid, Spain*

- Executed research applying LLM-based NLP to normalize medical text into SNOMED terminology and expressions.
- Addressed the challenge of accurate SNOMED mapping by designing NER strategies using LangChain and Retrieval-Augmented Generation with Elasticsearch, embedding similarity, and fuzzy matching.
- Implemented an end-to-end solution leveraging vector databases and semantic similarity to identify complex concept relationships.
- Reported key findings to senior leadership, influencing strategic decisions to expand data resources.

**Master's Internship** Oct. 2024 – Mar. 2025
***DMAIA UPM*** *Madrid, Spain*

- Developed an ECG-based arrhythmia classification system.
- Overcame signal analysis by extracting single-beat and time-range features from raw ECG data.
- Applied state-of-the-art feature extraction (morphological, wave-based, statistical) using NeuroKit2, SciPy, and Pandas; trained Random Forest, KNN, XGBoost, and a Time-CNN (PyTorch) to compare performance.
- Built an Arduino-based ECG acquisition device and validating it against a commercial 2-lead ECG system.
- Translated results into a functional Flask web app for ECG upload, real-time visualization, rhythm classification, and data storage using SQLite.

**Undergraduate Intership** Mar. 2021 – Aug. 2021
***SRM Consulting*** *Madrid, Spain*

- Studied machine learning methods for 3D scene reconstruction as alternatives to traditional photogrammetry, focusing on Neural Radiance Fields (NeRF).
- Created a desktop application using PySide to support training and validation workflows.
- Explored deployment and development tools, including Docker for containerization and FastAPI for building RESTful APIs.

## PROJECTS

**Chess move detection with Computer Vision**

- Engineered a real-time chess move detection system that reconstructs full games from video, even in low-light or low-quality conditions by accurately detecting piece positions.
- Integrated and fine-tuned InceptionV3 (PyTorch) for square-level detection and YOLOv8 for full-board detection, delivering a fully tested end-to-end solution.

**Aircraft Control with Reinforcement Learning**

- Simulated aircraft dynamics using linearized dynamic equations and numerical integration (4th-order Runge–Kutta).
- Tested autonomous control by building a custom Gymnasium environment with waypoint-based rewards and control surface actions.
- Trained a PPO agent (Stable-Baselines), resulting in an autonomous flight system capable of following waypoints.

## EDUCATION

**Master of Aeronautical Engineering, Aircrafts** Jul. 2025
***ETSIAE, Technical University of Madrid*** *Madrid, Spain*
**Bachelor of Aerospace Engineering, Aerospace Equipment and Materials** Jul. 2023
***ETSIAE, Technical University of Madrid*** *Madrid, Spain*