

Alberto Montero

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Summary

Health Engineer specialized in Bioinformatics, focused on Artificial Intelligence and data science applied to real-world problems. Research experience with LLMs, NLP, RAG and knowledge graphs, with a strong foundation in Python and Machine Learning and a keen interest in generative AI, automation and cloud services.

Research Experience

Researcher — Khaos Research Group

Sep 2025 – Aug 2026

University of Málaga

- Developed LLM and NLP workflows for semantic interoperability, improving ontology mapping accuracy by 15%.
- Built clinical web applications with Next.js, React, TypeScript, Python and REST APIs, including an alcoholism screening platform.
- Designed data integration *pipelines* leveraging Neo4j knowledge graphs and the Qdrant vector database to uncover implicit relationships within the CIMA pharmaceutical database.
- Applied semantic search, embeddings, *entity linking* and RAG workflows for biomedical data discovery.
- Trained and fine-tuned computer vision models (YOLO, MegaDetector) for object detection.

Collaborator — Computational Intelligence and Image Analysis

Mar 2025 – Jun 2025

University of Málaga

- Produced technical documentation for the ISIC Challenge (dataset acquisition, preprocessing and evaluation protocols).
- Analyzed state-of-the-art *deep learning* models for dermatological image classification.
- Conducted literature reviews of MICCAI 2024 publications on medical image analysis and skin lesion diagnosis.

Projects

DoseAI — Bachelor's Thesis — CDSS ■ Grade 10/10

- Clinical Decision Support System (CDSS) for prescribing safety: a Neo4j knowledge graph built from CIMA/AEMPS and enriched with few-shot NLP to structure interactions, contraindications and alerts from free-text drug labels.
- Graph-RAG engine with an LLM producing grounded, traceable clinical analysis, with a deterministic anti-hallucination verifier. Stack: FastAPI, Next.js/React, Neo4j, Docker.

Predictive Model for Cardiovascular Disease — Data Mining

- Machine Learning models reaching 88% accuracy for cardiovascular disease prediction; preprocessing, *feature engineering* and validation with Python, Pandas, NumPy and Scikit-learn.

Antibiotic Impact on Breast Cancer Response — Data Mining

- Predictive modeling of the effect of antibiotic exposure on neoadjuvant therapy response, using classification techniques and statistical analysis.

Aniridia and its Relationship with Other Pathologies — Systems Biology

- Bioinformatics analysis of genotype–phenotype relationships in aniridia and related syndromes (WAGR, Gillespie, Axenfeld–Rieger).

Education

B.Sc. in Health Engineering (Bioinformatics Specialization)

Sep 2021 – Jun 2025

University of Málaga

GPA: 7.4/10 | Distinction (Matrícula de Honor) in *Bioinformatics Projects*

Languages

Spanish: Native

English: B2 (Cambridge) — [view certificate](#)

Technologies and Tools

Programming: Python, TypeScript, Java, SQL **Data Science & AI:** Pandas, NumPy, Scikit-learn, NLP, LLMs, RAG, embeddings, computer vision (YOLO) **Databases:** MongoDB, MySQL, Neo4j, Qdrant **Web:** Next.js, React, Spring Boot **Semantic:** RDF, OWL, SPARQL, XML, JSON **Tools:** Git, Docker, cloud (Azure/AWS/GCP)