Álvaro Zorrilla Carriquí

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I am a proactive and responsible individual with a strong intellectual curiosity. I am motivated by tackling complex challenges and exploring interdisciplinary approaches that enhance my technical and analytical skills while allowing me to keep learning. Throughout my university studies, I have developed a solid problem-solving ability in fields such as mathematics, physics, and computer science. I have worked with programming languages including C++, Python, Fortran, R, MATLAB, and Mathematica, applying them to scientific computing, numerical analysis, data processing, and machine learning, as well as to the rigorous interpretation and presentation of results. Over the past year, I have participated in interdisciplinary projects—mainly in the field of Biomedicine—designing artificial intelligence models and analyzing large-scale data.

Education

University of Granada **Granada, Spain**
Double Bachelor's Degree in Physics and Mathematics *2018 – 2023*
GPA: 8.095/10

Bachelor's Thesis: *Interacting Fermionic Systems; from Few-Atom Optical Lattices to Bose-Einstein Condensates*

University of Granada **Granada, Spain**
Master's Degree in Data Science and Computer Engineering *2023 – 2024*
GPA: 9.02/10

Master's Thesis: *Diffusion Generative Models Applied to the Field of Medical Imaging (Grade: 9.8/10).* Code Repository

Experience

Pfizer–University of Granada–Andalusian Government Centre for Genomics and Oncological Research (GENYO) **Granada, Spain**
Researcher specialized in Data Science and Artificial Intelligence *2025 (6 months)*
Project: *PCA-MARK – Decision Support Tool for Treatment Selection in Prostate Cancer Patients*
Reference: PMPTA23/00025.
Funding: Spanish Ministry of Science, Innovation and Universities, Instituto de Salud Carlos III (ISCIII), and co-funded by the European Union (FEDER Funds).
Main responsibilities in the research group:

- Development and implementation of a bioinformatics pipeline for processing RNA-Seq data (FASTQ files) and generating gene expression count matrices.
- Design of a classification model based on machine learning techniques for stratifying prostate cancer patients according to their drug response, integrating genetic and clinical variables. This model is currently under patent process and being prepared for scientific publication (project repository).
- Application of explainable AI (XAI) techniques to interpret and analyze the behavior of the developed predictive models.
- Use of advanced statistical methods and machine learning/artificial intelligence algorithms in various complementary studies focused on patient stratification.

Signal Processing and Biomedical Applications Group (SiPBA) **Granada, Spain**
Predoctoral Researcher and PhD Student in the Information and Communication Technologies Program
October 2025 – Present

Position: Researcher at the University of Granada (UGR), specifically at the Andalusian Research Institute in Data Science and Computational Intelligence (DaSCI).

Department/Research Group: Department of Signal Theory, Telematics and Communications within the Signal Processing and Biomedical Applications group (SiPBA).

Project/Research Line: Artificial Intelligence in distribution networks (LI/EDistribución), under the .ENDESA-UGR Chair on AI in distribution networks".

Main Functions: Research in the field of power distribution networks within the SIPBA group.

Contract Type: Indefinite-term scientific-technical activities contract (under Art. 23 bis of the Spanish Science Law).

Self-employed **Granada, Spain**
Private Tutor *2023 – 2025*

Private tutoring in Mathematics, Physics, and Chemistry at university and high school levels

Conferences and Publications

European Human Genetics Conference **Milan, Italy**
Single-cell transcriptome analysis and inference by machine learning on prostate cancer fusion biopsy specimens identifies cancer-associated cells with diagnostic gene expression signatures *2025*

Fernando Marín-Benesiu, Verónica Arenas-Rodríguez, Sergio Cuenca-López, Álvaro Zorrilla-Carriquí, Beatriz Álvarez-González, Luis Javier Martínez-González, Maria Jesus Álvarez-Cubero.

Competitions and Awards

University of Granada **Granada, Spain**
Best Master's Thesis Award *2025*

Awarded Best Master's Thesis by the School of Computer and Telecommunication Engineering, in the Master's in Computer Engineering category.

University of Granada **Granada, Spain**
Finalist – Datathon, IX Bioinformatics Conference *2025*

Finalist in the Datathon for best master's project at the 9th Bioinformatics Conference.

2nd Andalusian Artificial Intelligence Congress **Granada, Spain**
Finalist – Best Master's Thesis *2024*

Finalist for Best Master's Thesis in the field of Artificial Intelligence among Andalusian universities.

UniversityHack Datathon **Madrid, Spain**
Third Place and Winner *2024*

Third place and winner of the 2024 edition of the UniversityHack Datathon organized by Cajamar. Link to 2024 edition

Courses and Workshops

University of Granada **Granada, Spain**
8th Bioinformatics Conference *2024*

- Workshop: *An overview of the machine learning workflow for biological applications*
- Workshop: *Learn R for RNA expression analysis*
- Workshop: *Introduction to regression techniques with R*

University of Granada, Google, and T-Systems — **Granada, Spain**
Data Engineering with Google Cloud — *2023 – 2024*

Coursera, IBM — **Online**
What is Data Science — *2023*

University of Granada (abiertaUGR) — **Granada, Spain**
MOOC: Machine Learning and Big Data for Bioinformatics — *2022*

Coursera, IBM — **Online**
Python for Data Science, AI & Development — *2022*

Languages

English — **C1**
ISE III – Trinity College London — *2024*

French — **Intermediate (B1/B2)**
No official certification

Spanish — **Native**

Additional Information

During my work on the PCA-MARK project, I independently developed a classification algorithm to predict patients' response to pharmacological treatment based on genetic and clinical data. This algorithm is currently under patent application and being prepared for scientific publication. Additionally, I handled large-scale data and high-volume files, using high-performance computing (HPC) techniques. For this purpose, I worked with several programming languages and processing tools, including Bash, Python, and R.