Miguel Sánchez-Palomino

msanchezpalomino.ddns.net | miguelsanchez1703@gmail.com | +34.699.19.19.28

Summary

Mathematician and Physicist, currently enrolled in a MSc in Bioinformatics, I aspire to build a research career in AI applied to healthcare. I'm a very curious and motivated person, who enjoys learning about virtually anything, but specially so when it comes to understanding the human body, AI, or the intersection of the two, a passion that I have chased through internships and work positions. I'm also a fast-learner, and eager to work with complex problems and abstract ideas. When working, I tend to be as efficient as possible and invest myself fully, always striving for the best possible outcome. I am independent, but also a team player, as I value the experience and traits from other members and try to adopt them when beneficial.

Education

2021 - 2026 **BSc in Physics @ Universitat de Barcelona (UB)**
BSc in Mathematics @ Universitat de Barcelona (UB)
Honours in Scientific Programming, Thermodynamics, Theoretical Mechanics and Astrophysics.
Graduated one semester early to pursue hands-on professional experience

2024 - 2025 **BSc in AI @ Universitat Politècnica de Catalunya (UPC)** (Dropout)
Started this degree alongside my fourth year of Mathematics and Physics with the idea of acquiring a more applied knowledge in AI. Dropped out after one semester, I realised that I would learn much quicker by working on real problems – the IRB internship or NEC working position that followed confirmed that.

2019 - 2021 **Upper secondary education, technological modality @ IES Pere Vives i Vich**
First student of my promotion, developed an Android app to actively cancel noise as part of a research project

Work Experience

Biomedical AI @ NEC Laboratories Europe (Heidelberg) Jun 2026 - Present

Visiting Researcher

- Development, training and implementation of SOTA AI methods to predict virus evolution
- Optimization and improvement of phylogenetic-informed protein pipelines
- Curation, analysis, alignment, metadata retrieval, phylogenetic tree construction of biomedical datasets
- Development of benchmarks to assess performance of models against current SOTA

SBNB @ Institute of Research in Biomedicine (IRB Barcelona) Jul 2025 - Feb 2026

Curricular Internship + Math/ Physics Degree theses under Dr. Aloy supervision

- Analysis of the physicochemical structure captured on DL models' latent spaces for bioactive compounds
- Explore the fundamentals of explainable AI architectures based on Kolmogorov-Arnold Networks (KANs)
- Design of a methodology to quantify complex structure recollection in high-dimensional latent spaces
- Manipulation and development of large databases and high-performance computing environments

CRISTAL Mission (European Space Agency) @ IsardSAT Jul 2023 - Sep 2023

Student Junior Backend Programmer

- Backend algorithms implementation and revision for a low resolution processor in C++ and MATLAB
- Run tests and validate output results based on former satellite data
- Proofreading official documentation on developed algorithms and software

SBNB @ Institute or Research in Biomedicine (IRB Barcelona) Jul 2023 - Sep 2023

Maths4Life Grant Student under Dr. Aloy supervision

- Research in molecular embeddings discerning stereochemical properties using extensive deep learning models
- Filtering, manipulating and splitting of large molecular datasets
- Development of benchmarks to evaluate the performance of high dimensional molecular embeddings

Publications

[1] Arnau Comajuncosa-Creus, Aksel Lenes, Miguel Sánchez-Palomino, Dylan Dalton, and Patrick Aloy. "Stereochemically-aware bioactivity descriptors for uncharacterized chemical compounds". In: *Journal of Cheminformatics* 16.1 (June 2024). DOI: 10.1186/s13321-024-00867-4.

Computational Skills

Advanced	Python (AI, OOP, data science and data visualization) Bash (scripting, file manipulation, etc.) MATLAB (numerical simulation, symbolic programming)
Intermediate	R, C/ C++, HTML, JSON
Basic	Java, Javascript, CSS

Familiar with git directories, Linux operating systems, high-performance computer environments, SLURM, Docker and LaTeX.

Familiar with AI model architectures, training and finetuning processes, implementations, and data preparation

Languages

Spanish (mothertongue), Catalan (mothertongue), English (nativelike; accredited C1 level (CAE) in 2019 and B2 level (FCE) in 2018), Italian (conversational), German (basic knowledge)

Other Experience

Academic experiences

For four years straight I was among top 1% scores in *Proves Cangur*, a famous Catalan mathematics problem-solving competition. Also in 2019 I was awarded the competitive *Bojos per les matemàtiques* grant, which is given to 25 high-performing students to assist to additional lessons on mathematics by distinguished people from the field. During university years, I taught on three occasions in Mathematics/ IT workshops for upper secondary students and given a seminar on how to optimally win tic-tac-toe using graph theory.

Volunteering experiences

On August 2022 I spent a month on a German farmstead where I helped renovate a stable, build a wooden fence, gather wood, gardening tasks, etc. Also during the four months between graduation and my start at NLE, I rewired the whole sound system of a Spanish-folklore association in a nearby town, rebuilt a trailer in order to gather fallen wood helping to keep trails and forests in optimal state and renovated an apartment

Projects

Personal server

Website

I have two interconnected Raspberri Pi's set up at home that function as a personal server. This setup allows me to host my personal website and blog, serves as a share-point and file server where automatic backups of my devices are performed periodically, hosts an MCP server so an AI agent can provide me with customized training advice, gives me full access to a Linux terminal from my phone, or allows me to remotely control multiple IoT devices from my house.

With this I have been capable to configure my blinds to seize the sunlight and regulate the temperature of the house both in winter and in summer. Additionally it also connects via an API to automatically lower the blinds in episodes of heavy rain. Originally the whole server could be controlled through a self-coded telegram bot, but I later migrated it to a more mainstream open-source framework.