Xavi Arnal

xavi.aclm@gmail.com **|** +34 629486185

⊕ [Website](#) | [GitHub](#) | [Linkedin](#)

Experience

Junior Software Engineer | *Huum Fresh* — Feb 2024 - Jul 2025
- Developed data ingestion pipelines for client inventory systems via CSV exports
- Built tools to detect spoilage risks and optimize perishable goods supply chains
- Created automated alert systems and periodic analysis reports for retail clients

Early stage researcher | *NVIDIA + TU/e* — Jan - Oct 2023
- Developed telemetry and performance analysis tools to identify bottlenecks.
- Optimized implementation of post-quantum cryptography on NVIDIA DPUs.
- Delivered regular presentations on research progress and technical findings to a large team, receiving commendations for clarity and effectiveness.

Research assistant | *Universitat Politècnica de Catalunya* — Feb - Nov 2022
- Worked in the application of post-quantum cryptography in electronic voting.
- Co-developed, benchmarked and optimized cryptographic protocols in Rust.
- Assessed resilience of said protocols against quantum adversaries.

Freelance teacher — 2017 - 2022
- Undergrad to early grad level, in mathematics and computer science
- Volunteer mentor in Universitat de Barcelona's olympiad program (2019)

Skillset

PROGRAMMING LANGUAGES	Python *(primary)*	C	JavaScript	Java	Rust
PYTHON LIBRARIES	NumPy	Pandas	Selenium	SQLAlchemy	FastAPI
TECHNOLOGIES	SQL	Git	React	Docker	Linux	PyTest

Education

MSc in Mathematical Engineering | *U. Politècnica de Catalunya* — 2021 - 2022
- Minor in Innovation and Research in Informatics
- Thesis on *multivariate cryptography key optimization* (Honors | [report](#))

BSc in Mathematics | *Universitat de Barcelona* — 2016 - 2021
- Minor in Computer Science
- Thesis on *topological generalization metrics in deep learning* (9.4 | [report](#))

Independent projects

Tansō (github) - Language learning tool for sentence-based Anki card generation. Includes automatic parsing, sentence retrieval, dictionary integration, and audio synthesis.

Technologies: SQLAlchemy, PyQt6, AnkiConnect, ffmpeg

planets (github, website) - A highly configurable astrology dashboard with extensive customization options. Powered by a client-side astronomic calculation engine.

Technologies: React, Typescript/Javascript, astronomy-engine

Resonant (github) - Music library analysis tool that extracts emotional embeddings from tracks and builds similarity-based playlists and graphs. Includes web UI and REST API.

Technologies: FastAPI, SQLAlchemy, TensorFlow, h5py, D3.js

cps_sat (github) - CNF modeling toolkit with SAT-style constraints and solver integration.

Awards

Bronze medalist | International Mathematics Competition   2019

2nd place | Prova Santaló   2019

1st place | Torneig de Tardor, UB   2019

2nd place | Torneig de Tardor, UB   2018