

# Alejandro Martínez Ronda

POST-QUANTUM CRYPTOGRAPHY · LATTICE-BASED CRYPTOGRAPHY · APPLIED MATHEMATICS

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Double-degree **Mathematical & Computer Engineer** focused on **post-quantum cryptography** and its mathematical foundations. Bachelor's thesis implementing a **lattice-based (LWE)** scheme from scratch and studying the NIST standards **ML-KEM** and **ML-DSA**, backed by industry experience in data engineering and machine learning. I pair mathematical rigor with software to build secure, verifiable systems.

## RESEARCH — POST-QUANTUM CRYPTOGRAPHY

### ★ Learning With Errors (LWE) — Bachelor's Thesis [GitHub](#) →

- Implemented a **Regev-style LWE** public-key scheme from scratch in **Python**, covering key generation, encryption and decryption over the lattice.
- Evaluated **decryption-failure probability** across noise, modulus and lattice dimension, characterizing the security–correctness trade-off in parameter selection.
- Studied the NIST post-quantum standards **ML-KEM (Kyber)** and **ML-DSA (Dilithium)** and their lattice-based foundations.

**STACK** Learning With Errors · Lattice-based Cryptography · ML-KEM · ML-DSA · Python

## EDUCATION

**B.Sc. Mathematical Engineering** — Universidad Alfonso X el Sabio (UAX), Madrid · Degree completed **2022 – 2026**

**B.Sc. Computer Engineering** — Universidad Alfonso X el Sabio (UAX), Madrid · Final year **2022 – 2027**

**International Exchange — Investment Project Evaluation** — Universidad Nacional de Río Cuarto, Argentina **Jan – Jun 2026**

## EXPERIENCE

**Data Architecture & Engineering Intern · Havas Media Group** — Madrid **Dec 2025 – Feb 2026**

- Built cloud data pipelines and advanced data modeling on **Google Cloud** with **Dataform**.
- Wrote complex **SQLx** transformation logic and led **BigQuery** optimization to cut query cost and runtime.
- Managed **GitLab** version control and resolved incidents in automated, high-availability data flows.

**STACK** Google Cloud · BigQuery · Dataform · SQLx · GitLab

**Data & Modeling Intern · DeNexus** — Madrid **Nov 2024 – Feb 2025**

- Built an end-to-end pipeline extracting cybersecurity incidents from **SEC Form 8-K** filings (scraping **SEC EDGAR** into a live incident repository).
- Classified incidents with ML and **NLP/LLM** models (**BERT, LLaMA**) and generated semi-automated reports on **Databricks**.

**STACK** Python · Databricks · BERT · LLaMA · NLP · Web Scraping

**Project Management Intern · Havas Media Group** — Madrid **Sep 2025 – Nov 2025**

- Owned task definition, validation and delivery tracking; reviewed deliverables and flagged improvements that kept timelines on schedule.

**STACK** Agile · Delivery Tracking · Stakeholder Comms

**Sales Manager & Teller · BBVA** — Alicante **Summers 2023 & 2024**

- Managed banking operations and financial-product support in a high-volume branch.

## SELECTED PROJECTS

### Financial Evaluation & Simulation [GitHub](#) →

5-year financial model (DCF, NPV, IRR, sensitivity, break-even) with **Monte Carlo** simulation for a zero-knowledge, post-quantum cloud-security concept.

**STACK** Monte Carlo · Financial Modeling · Python

### Simple Random Walks [GitHub](#) →

Simulation and statistical analysis of simple random walks — foundations of stochastic processes and Brownian motion.

**STACK** Stochastic Processes · Probability · Simulation

### RNN — Stock Price Prediction [GitHub](#) →

Recurrent neural network for time-series forecasting of stock prices — sequence modeling with deep learning.

**STACK** Deep Learning · RNN · Time Series · Python

## TECHNICAL SKILLS

**Cryptography & Security** **Post-Quantum Cryptography, Lattice-Based Cryptography**, Learning With Errors, ML-KEM, ML-DSA, Cybersecurity

**Mathematics** **Applied Mathematics**, Probability, Statistics, Linear Algebra, Optimization

**Programming** **Python**, SQL, Java, JavaScript, Bash

**AI & Data** Machine Learning, Deep Learning, NLP, LLMs, Google Cloud, BigQuery, Databricks

**Tools** Git, GitHub, GitLab, Linux, Agile

## LANGUAGES & CERTIFICATIONS

**Languages** Spanish (native) · Catalan (native) · English — C1 Advanced (CAE)

**Certifications** Ironhack Data Analytics Bootcamp · Microsoft Power BI · Storytelling (Coursera)