# Santiago Miranda

Inverness, UK | ☎ 07871849203 | Willing to Relocate | santimir@pm.me

## Developer History

**2025**: Open Source Development

**Rust Embedded**: microrsrs/esp32-c6 is a book for Rust Embedded development for newcomers. The book is free and open source.

**FSF**: Participated in the development of the Machine Learning position that the Freedom of Software Foundation will publish in the future (it's not available to the public yet).

**Web Standards**: *Request for position* to Mozilla and Safari regarding WebNN. They are copies, here is Request for position for WebNN to Mozilla. Specification issues and feedback WebNN repository.

**Learnt Rust**: Upgrade skills for the new era of AI, and for Rust development. Besides the book, I wrote an mdbook preprocessor for fetching remote markdown. The full activity summary is over here. The link is to the account I use primarily for learning.

**2024**: Research Associate at Glasgow University

**Robotics and Artificial Intelligence**, The Digital Chemistry Group is a research group led by Leroy Cronin. The group develops software for a robot capable of performing chemical experiments.

My primary contribution was to refactor and train a Chemical Variational Auto-Encoder (CVAE), that encodes molecules into vectors. The neural network was trained in a HPCC (High Performance Computing Cluster). Functionality was added to run this project in a web browser. The code is private due to licensing, but the reference work (unmaintained) project can be found at aspuru-guzik-group/chemical_vae.

After a brief period, I realise that this role was not a good fit for me, primarily due to my limited experience with Robotics. I decided to leave the role and take some time off, during which I implemented the paper "*TNT: A Solver for Large Dense Least-Squares Problems that Takes Conjugate Gradient from Bad in Theory, to Good in Practice*" in Typescript. The code can be found at santi-mir/fit-tnt.

For the application to this job, I made a brief video-presentation that summarises most of my work. The presentation is on Youtube.

**2022-2024**: Typescript Developer at Zakodium

**Chemical Data Binary Parsers**. NMRium is a web-platform for NMR (Nuclear Magnetic Resonance) visualisation and analysis. My role involved writing binary data parsers for NMR data. For example, a Varian Converter to parse (Varian/Agilent) data.

**Image analysis**. Anonymisation of personal information in Identity Cards, for Interpol and other organisations. A public playground, which was used as proof-of-concept, is available at MRZ Website. An ID-card image can be dropped or uploaded to test it. The networks run locally (in your device) and no data is sent out to a server.

This project involved several interesting challenges:

1. Creating a database of IDs,
2. Augmenting and cleaning the data,
3. Fine tune neural networks to remove signatures, faces and barcodes,
4. Compress models to a minimum (700 KB) to reduce the latency and loading time (for example, using quantisation from floating point to integers.)
5. New classification networks in PyTorch (from scratch), to fix the perspective of the ID card automatically.

**Optimisation**. Fast-Combinatorial Non-Negative Least Squares, published in Zenodo and available at mljs/fcnnls.

**2021-2022**: Projects for Cheminfo and EPFL

**Binary Parsers**. wdf-parser converts Raman binary files to JSON-like objects. A similar project is spc-parser.

**IOBuffer**. A project I am involved in is IOBuffer, a Typescript library for manipulating binary data.

**File Handling**. To harmonise the way NodeJS and FileList Web API handle files we wrote filelist-utils (with many collaborators).

**Smaller Projects**. Simple recursive directory reading and side projects published to theNPM (Node Package Registry).

NPM Github

**2020-2022**: Developer Hubs

Active member of the MongoDB Developers Forum.

**2017-2019**: Chemistry Teacher

Introduction to Chemistry at *Instituto Superior de Formación Docente* (Institute for Teacher Training), Argentina. The role consisted of teaching chemistry to aspiring High School teachers. It involved planning and supervising laboratory experiments, delivering lectures, and grading the students.

## Higher Education

**2015-2017**

MSc in Physical Chemistry at University of La Plata, Argentina.

**Thesis**: *Thermodynamics of chemical reactions in condensed phase*. The thesis involved integrating packages for conformer generation, solvent-effect simulation, and quantum mechanics and statistics. Programming Language: Python.

The thesis was developed at the Centre For Inorganic Chemistry and supervised by Martin Lavecchia (lavecchia@gmail.com) and Carlos Franca.

**2012-2015**

Chemistry Degree at University of La Plata, Argentina.

The first 3 years were in general chemistry with a strong mathematical background (physics, calculus, linear algebra.)

## Hobbies

**Gap Year**

During 2019-2021 I volunteered at farms, hostels, and other places while travelling. In my spare time I learnt Javascript. As a learning exercise during this process, I coded a blog. Later on, this experience helped me land my first job as a Typescript Developer.

**Time in Nature**

Jogging or walking outdoors help disconnect and recharge.

After volunteering for Buddhist Centres I made a habit of meditating and breathing exercises. I perform this daily, early in the morning.

**Computer-Related Hobbies**

I like to learn about programming languages. The most recent one is Rust. Another hobby of mine is to experiment with Arduinos or ESP32s, primarily to program its sensors. I also like philosophy and physics.