# Pedro M. F. Pereira, PhD – Curriculum Vitae

## Personal Profile

**Age: 29; Nationality: Portuguese; My GitHub**

**Contacts: pp144@proton.me; My Linkedin**

I am an aspiring polymath with a formal education in Science and Technology and an informal one in everything else.

Currently, my primary interest lies in blockchain technology, particularly its applications in digital identity (DIDs, VCs), privacy (user-centric data ownership, zero-knowledge proofs, homomorphic encryption), and governance (DAOs, voting systems).

I am committed to contributing to the modernisation of financial and governmental infrastructures, with the goal of empowering individuals to reclaim control and ownership from large corporations and governments.

During my PhD, I frequently presented my work and engaged in discussions on complex topics, honing my ability to communicate intricate concepts in a clear and accessible way. This skill, further developed through positive teaching experiences, drives my passion for outreach and improving public literacy on blockchain.

## Work Experience

**2024-**

**Blockchain Engineer at Parfin** - Remote, Lisbon

**2023-**

**Blockchain Developer at Celfocus** - Hybrid, Lisbon

- Gained expertise in Decentralized Identifiers (DIDs) and Verifiable Credentials (VCs) while working on **Identity and Credential Management**. This project involved utilizing technologies such as Hyperledger Besu, Quorum, KILT, React, Node.js, and Express.js.
- Developed smart contracts in Solidity for an **NFT-based Carbon Credit Marketplace**, enhancing my experience with Ethereum, Polygon, and EVM networks. This role also involved using Hardhat, Metamask, Truffle, and Foundry, as well as developing serverless REST APIs using Node.js, TypeScript, and Azure Functions. The Solidity contracts were designed to be pausable and included access control with three distinct roles. Interactions among the four contracts were managed through interfaces and trigger functions. Each contract utilized a library containing stateless definitions and pure logic functions. Additionally, the contracts featured numerous mappings and handled various events.
- Contributed to a **Token-based Loyalty System Project** within a Hyperledger Fabric framework, where I wrote smart contracts (chaincodes) in Golang and developed Fabric applications in Java to enable communication between the chaincodes and the backend.
- Built an extensive set of reusable libraries, APIs, configuration files, and deployment strategies utilizing Node.js, TypeScript, and Vercel Turborepo. These tools are designed to effortlessly integrate EVM-based chains and Hyperledger Fabric in future blockchain-based solutions.

Throughout these projects, I collaborated in a team environment adhering to an agile framework, employing tools such as GIT, Jira, and Jenkins for version control, task management, and CI/CD processes.

**2021-2023**

**Teaching Assistant of Physics of Continuous Media at Instituto Superior Técnico, Lisbon**

- Responsible for teaching classes on problem sets within the "Physics of Continuous Media" course. I won the award for the best teaching assistant of the 3rd year of the bachelor's in Physics, awarded by the students.

**2017-2020**

**Teacher of Programming and Technology at Happy Code Lumiar, Lisbon**

- Taught app and game development to students aged 7-16. Used Unity, C# and Java.

**Private Tutor of High School Mathematics and Physics, Lisbon**

## Academic Education

**2019-2023**

**PhD in Theoretical Particle Physics** - Instituto Superior Técnico, Lisboa

- Thesis available here
- My Physics Publications

**2016-2018**

**Master Degree in Theoretical Particle and Nuclear Physics** - Instituto Superior Técnico, Lisboa

- Exchange Semester in Theoretical Particle Physics at University of Amsterdam

**2013-2016**

**Undergraduate Degree in Physics Engineering** - Instituto Superior Técnico, Lisboa

## Courses & Certifications

A selection of the most relevant, see full list at my Linkedin.

- **2023:** Certified Quorum Developer - Blockchain Council - my notes.
- **2023:** Ethereum and Solidity: The Complete Developer's Guide - Udemy - my notes.
- **2023:** Full Web3 Website Course - Learn Web3 with EdRoh - my notes.
- **2023:** Ethereum and Solidity Course - CryptoZombies - my notes.
- **2022-2023:** Cardano Developer Course - Gimbalabs - my notes.
- **2022-2023:** IOG Haskell Course & Haskell on Exercism - IOG - my notes.

## Skills

**Machine Learning/AI**

- Fitting a model to experimental data via Loss function minimization, see this repository.
- Reinforcement Learning, see this repository.

**Programming Languages**

- C, C#, C++, Python, Haskell, Java, Javascript, Typescript, GOlang, Rust.

**Blockchain**

- Cardano/Plutus, Ethereum/Solidity, Polygon and EVM networks, Hardhat, Ethers, Truffle + Ganache, Foundry, KILT, Hyperledger Besu, Hyperledger Fabric, Quorum.

**Web Development**

- Backend: Node.js, Express.js, Azure Functions.
- Frontend: React, CSS, HTML.

**Software Miscellaneous**

- Git, Jira, Postman API, REST APIs, Markdown, CERN's ROOT, Linux, Bash Scripting, Mathematica, LaTeX, Unity, MIT App Inventor.

**Languages**

- Portuguese (Native), English (Fluent), Spanish (Intermediate), Italian (Beginner), French (Beginner).