






Pablo Lozano Rodríguez

Cryptography, machine learning, distributed systems and Rust

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EXPERIENCE

T3RN | SOFTWARE DEVELOPER

Oct 2022 - Ongoing | Remote (based in Spain)

- SDK developing with Rust and Substrate for a parachain within the Polkadot ecosystem.
- Working with a Web3 stack, focusing on applying systems design to do, among other things, runtime upgrades, and improve current product with ZK protocols.
- Focus on Cross-chain Virtual machines, bridges and Cross-Chain messaging standard (XBI) based on XCM.

ITCL | SOFTWARE RESEARCHER

Nov 2022 - Mar 2023 | Spain (freelance)

- Project: embedding neural network architectures within FPGAs to improve latency.
- Project: validity proofs for ML models using ZK validity proofs on-chain.

CENTRAL EUROPEAN UNIVERSITY | POSTDOCTORAL FELLOW

Sep 2021 - Apr 2022 | Vienna, Austria

- Research on distributed (machine) learning, graph theory, and explainable AI.
- Implementation of high-performant algorithms for distributed ML.

INTECH-A | MACHINE LEARNING ENGINEER

Sep 2021 - Aug 2022 | Remote (based in Austria)

- DevOps tasks to put ML applications into production, developing ML algorithms and doing data analysis, using mainly Python and R.

IRONHACK | LEAD TEACHER

Sep 2020 - Dec 2021 | Madrid, Spain

- Teaching course on Machine Learning, Data Science as well as Data visualisation, using Python, R, and related frameworks.

UNIVERSIDAD CARLOS III DE MADRID | PREDOCTORAL FELLOW

Sep 2016 - Sep 2021 | Madrid, Spain; Knoxville, TN (USA)

- Designed and implemented mathematical, agent-based models, large-scale behavioural experiments, and ML algorithms to study human behaviour.
- Collaboration with world-renowned researchers from EEB Department @ UTK (USA).
- Systems Administrator with Linux and Windows.

PUBLICATIONS

ARTICLES IN JOURNALS

- 'Improving performance in distributed learning systems', [Lozano](#) et al. (Late 2023).
- 'Hierarchies and social norms: an experimental approach', [Lozano](#) et al. PNAS Nexus 2, pgac283 (2023)
- 'Cooperation, social norms, and hierarchical societies', [Lozano](#) et al. Scientific Reports 10, Article number: 15359.
- 'Cooperation on dynamic networks within an uncertain reputation environment', [Lozano](#) et al. — Scientific Reports 8, Article number: 9093.

SKILLS

LANGUAGES

Proficient:

Rust • Typescript • Javascript
• Python • R

Experienced:

C • SQL • R • Elixir • Haskell

TOOLS

Cryptography

Cryptographic protocols and systems • Zero Knowledge proofs (SNARKs, STARKs) • DSLs and ZK-specific libraries (Circom, Noir, Zokrates...) • Arithmetic circuits • Elliptic curves • Discrete math.

OTHERS

Git • Docker • Analog and digital electronics • Circuit and chip design and manufacturing • FPGA design and programming • Math. optimization • Category theory

Project management

Agile • Scrum • Extreme programming (XP), step-wise QA

EDUCATION

PH.D. IN APPLIED MATHEMATICS

SUMMA CUM LAUDE

Universidad Carlos III de Madrid

Sep 2018 - Apr 2022

MASTER'S IN MATHEMATICS

SPEC: COMPLEX SYSTEMS

Universidad Carlos III de Madrid

Sep 2016 - Jun 2018

BACHELOR'S IN INDUSTRIAL ENGINEERING

SPEC: INDUSTRIAL ELECTRONICS

Universidad Carlos III de Madrid

Sept 2012 - Jun 2016