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Pepa Montero Jimena

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Profile

Mathematician formalizing mathematics in Lean 4, with 14 merged Mathlib PRs, mostly in differential geometry and topology. Researcher at Basotek and MSc student in Formal Methods. I review Mathlib PRs, teach Lean, and am interested in autoformalization and formal methods for reliable AI.

Experience

Researcher, Basotek S. Coop. (Zoocanica) — Sep 2024 – Present
LinkedIn page ↗

- Number theory research on prime numbers and their application to data compression algorithms, formalizing selected results in Lean 4.

Lean and Mathlib

Mathlib Contributor — 2026 – Present
14 merged PRs ↗

- **Quotient manifolds.** Quotients of charted spaces by free, properly discontinuous group actions are charted spaces (#35653), begun at ItaLean 2025 ↗. Now extending it to smooth manifolds (#40727, in review).
- Further API and refactors for L-series, proper group actions and Lie brackets.
- **Reviewing.** Reviewed 11 PRs by others, in analysis, algebra, computability, topology and geometry.

Fermat's Last Theorem Autoformalization Workshop, London — Jul 2026
FLT project ↗

- Used AI assistants to autoformalize results for Kevin Buzzard's FLT project.
- Reviewed and simplified AI-generated proofs on the Tate curve (FLT #1091), then generalized reusable lemmas into Mathlib (#41502, #41498, both merged).

Bachelor's Thesis: Formalization of Urysohn's Lemma — Jun 2024 – Jul 2025
Report in Verso ↗

- Original formal proof of Urysohn's lemma in Lean 4, following Willard's *General Topology* rather than Mathlib's approach. Awarded the highest grade.

Teaching and Community

Lean Instructor, CompuMates, Complutense University of Madrid — Oct – Nov 2026
Course website ↗

- Co-teaching a 10-hour introductory Lean course; course notes written in Verso.

Co-organizer, MadLean — 2025 – 2026
MadLean website ↗

- Co-founded and ran Madrid's first regular Lean meetup: talks (including my own on the quotient manifolds PR), study sessions and teaching for newcomers.

Spanish translations of Robo ↗ (Lean Game Server) and Verbose Lean ↗ (in progress).

Education

MSc in Formal Methods in Computer Science, Complutense University of Madrid — Oct 2025 – Present
BSc in Mathematics, Complutense University of Madrid — Sep 2019 – Jul 2025

Skills

Formal methods: Lean 4, Verso, Dafny, Liquid Haskell, Maude, Prolog
Programming and tools: Python, C++, Java, R, Bash, LaTeX, Git
Languages: Spanish (native), English (C2, proficient)