Cristopher Erazo

PhD student in Theoretical and Scientific Data Science

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Homepage
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Research interests: *Training dynamics and learned representations of neural networks, studied with statistical physics and information theory. Current focus: emergence of in-context learning in transformers.*

Education

2024 – Present **Ph.D. in Theoretical and Scientific Data Science**, *SISSA* — Trieste, Italy
Theory of Neural Networks group. Supervisors: Sebastian Goldt and Jean Barbier

2023 – 2024 **Postgraduate Diploma in Quantitative Life Sciences**, *ICTP* — Trieste, Italy
Thesis: *Dimensionality of Activity in Recurrent Neural Networks*

2015 – 2020 **B.Sc. in Physics**, *EPN* — Quito, Ecuador
Five-year degree program

Selected Projects

TrackLab and Rewind. Python packages that turn your training script into a live object you can steer, rewind and fork while it runs. Written with `shiny`.

Neural network training toolkits. Python packages to train neural networks (MLPs and transformers) with gradient descent on synthetic data tasks. Written with `pytorch`.

Land ownership in EU. Data-journalism collaboration on land use and farm subsidies in the EU. Built databases with `sql` and `pandas`, visualizaition with `plotly` and `matplotlib`.

Spin Sampler. Python package for efficient sampling of spin systems. Backend in `numpy`, `numba` and `jax`.

Recent Participations

Nov 2026 **School in Mathematical Foundations of AI Safety**, *SISSA* — Trieste, Italy
AI alignment · *Deep Learning* · *Singular Learning Theory*

Jun 2026 **Reinforcement Learning Summer School 2026**, *PoliMi* — Milano, Italy
Foundations and mathematics of RL · *Frontiers and applications of RL*

Jul 2026 **7th Youth in High-Dimensions**, *ICTP* — Trieste, Italy
Machine Learning · *Statistical Physics* · *Computational Neuroscience*

Teaching Experience

2021 – 2023 **Laboratory Technician**, *EPN* — Quito, Ecuador
Lectures for undergraduate students in experimental physics, data analysis and data visualization.

Publications

Erazo, C., Acevedo, S., & Ingrosso, A. (2026). The dimensionality of the Hopfield model. *Physica A: Statistical Mechanics and its Applications*, 695, 131609.

Honors & Awards

2024 Qaisar and Monika Shafi Prize for Outstanding Performance, *ICTP*

2024 Best Performing Student in Quantitative Life Sciences, *ICTP*

2016 – 2020 Academic Excellence Scholarship, *EPN*

Skills

Programming: Python, Shell scripting (Bash), SQL

Tools: Git version control, HPC clusters, Linux

Languages: Spanish (native), English (fluent), Italian (conversational)