

Frederico J.J.B. Santos

PhD Candidate in Applied Data Science & Artificial Intelligence

📍 Trieste, Italy

✉ fredericojose.jacomedebritosantos@phd.units.it

🆔 ID 0000-0003-3589-7877

🌐 /fredericobsantos

📧 /fredericosantos

🐦 /fredericosantos



Frederico is a PhD candidate at the University of Trieste, using methods from evolutionary computation to design a GPU-native PyTorch framework for neuroevolution. Now in his second year, he has authored five peer-reviewed publications, including a Q1 journal article and papers at CORE A conferences.

Education

PhD in Applied Data Science & Artificial Intelligence

Oct 2024 to Present

University of Trieste, Italy

- Designing a GPU-native PyTorch framework that evolves neural network topologies through composable blocks at micro- and macro-structural scales.
- Evolved Particle Swarm Optimization velocity rules via Genetic Programming, building toward population-based optimizers for neuroevolution.

MSc in Data Science & Advanced Analytics

Sep 2020 to Jan 2023

NOVA Information Management School, Portugal

GPA 18/20; thesis later adapted for publication in *Applied Soft Computing*.

BSc in Management & Business Administration, Católica Lisbon School of Business & Economics, Portugal.

Publications

- **Visualizing the Semantic Space Exploration of Ensemble Methods.** F.J.J.B. Santos, J. Muñoz Contreras, B. Sakalliglu, D. Melendez, A. Tonda, L. Trujillo. *GECCO 2026*.
- **Combining Grammatical Evolution with LLM-based Local Search to Improve Interpretability.** B. Sakalliglu, F.J.J.B. Santos, D. Parra, Y. Qiu, M. Nicolau, L. Trujillo, J.I. Hidalgo. *EvoApplications 2026, Best Poster Runner-Up Award*.
- **NEVO-GSPT: Population-Based Neural Network Evolution Using Inflate and Deflate Operators.** D. Farinati, F.J.J.B. Santos, L. Vanneschi, M. Castelli. *EuroGP 2026*.
- **Learning the Particle Swarm Optimization Velocity Update via Genetic Programming.** F.J.J.B. Santos, A. De Lorenzo, L. Manzoni, G. Pietropolli. *GECCO 2025*.
- **Neuroevolution with Box Mutation: An Adaptive and Modular Framework for Evolving Deep Neural Networks.** F.J.J.B. Santos, I. Gonçalves, M. Castelli. *Applied Soft Computing*, 2023 (Q1).

Experience

Research & Data Mining, RADAR-AIM (Erasmus+ Cooperation Partnership)

Aug 2025 to Present

Led WP2 of an EU programme on AI for sustainability: scraped and curated a dataset of 300+ courses, designed an AI-integration taxonomy, and ran keyword-based classification.

Data Science Research Intern, CrowdSec

Nov 2023 to May 2024

Built a research framework for real-time malicious-HTTP detection in PyTorch; benchmarked fastText, RoBERTa, and Random Forest classifiers; CLI for training, evaluation, and ONNX export.

Machine Learning Consultant, A400 (Structural Engineering)

Mar to Oct 2023

Designed an algorithm that automated 90% of rebar layout placement, cutting per-region engineer time from ~20 minutes to under one.

Awards & Service

Meta-sponsored Udacity Scholarships for Deep Learning (2018) and Deep Reinforcement Learning (2019) Nanodegrees. SPECIES Summer School on Evolutionary Computation, Moraira, Spain (2025).

Conference Volunteer at EvoStar 2025 and Ital-IA 2025, Trieste.

Languages

English (fluent), Portuguese (native), Italian (A1).