

Francesco Innocenti

Oxford, UK

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Experience

- Nov 2025 - **Postdoctoral Researcher**, University of Oxford, UK.
present ○ Research at the intersection of Machine Learning and Computational Neuroscience.
- Oct 2023 - **Applied Scientist Intern**, Amazon, Barcelona.
- Apr 2024 ○ Helped improve and evaluate a short-term forecast of Amazon packages delivered throughout Europe, contributing to an internal conference paper and \$MM savings in operational costs.
- Jun-Aug **Research Intern**, TIMING, AWARENESS, AND SUGGESTION LAB.
- 2020 ○ Trained and tested machine learning classifiers to categorise the subjective experiences associated with different psychedelic drugs, based on psychometric data from 55 peer-reviewed studies.

Education

- Sept 2021 - **PhD, Machine Learning & Theoretical Neuroscience**, University of Sussex, UK.
2025 ○ Thesis: "Towards Scaling Deep Neural Networks with Predictive Coding: Theory and Practice".
 ○ Teaching Assistant on Fundamentals of Machine Learning.
 ○ Developed **JPC** (★ 57), a JAX library for training neural networks with predictive coding.
 ○ Curated repositories of papers on **Neuro-AI** (★ 47) and **Hessian of neural networks** (★ 2).
- Sept 2018 - **BSc, Psychology with Cognitive Neuroscience**, Goldsmiths, University of London.
Jun 2021 ○ 1st Class Honours.†
 ○ Thesis: "Modelling the Evolution of Visual Perception with Evolutionary Algorithms".

Skills

- Coding Python (highly experienced), git (highly experienced), Docker (basic) CI/CD (experienced), SQL (experienced), AWS (experienced), SLURM (basic), LATEX (highly experienced).
- Autodiff. PyTorch (highly experienced), JAX (highly experienced).
- Web dev. HTML (basic), streamlit (experienced).
- Languages English (proficient), Italian (native), Spanish (fluent).

Selected papers

- [1] **Innocenti, F.**, and Achour, E. M. (2025). A Simple Generalisation of the Implicit Dynamics of In-Context Learning. *NeurIPS Workshop on What Can('t) Transformers Do?*.
- [2] **Innocenti, F.**, Achour, E. M., and Buckley, C. L. (2025). μ PC: Scaling Predictive Coding to 100+ Layer Networks. *Advances in Neural Information Processing Systems 38*.
- [3] **Innocenti, F.**, Achour, E. M., Singh, R., and Buckley, C. L. (2024). Only Strict Saddles in the Energy Landscape of Predictive Coding Networks? *Advances in Neural Information Processing Systems 37*.
- [4] ***Innocenti, F.**, Singh, R., and Buckley, C. L. (2023). Understanding Predictive Coding as a Second-Order Trust-Region Method. *ICML Workshop on Localized Learning*.

Awards

- *Best Paper Award at the ICML 2023 Workshop on Localized Learning.
○ †British Psychological Society (BPS) Award for highest performance in undergraduate degree.