Antonio Franca Ibañez

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EDUCATION

University of Cambridge — Cambridge, England
MPhil in Machine Learning and Machine Intelligence — Oct 2024 – Present

- Member of the Department of Engineering, Queens' College.
- Relevant courses @Cambridge: Reinforcement Learning and Decision Making, Deep learning & Structured Data, Probabilistic Machine Learning, Geometric Deep Learning, Computational Neuroscience

Vrije Universiteit Amsterdam, VU — Amsterdam, Netherlands
BSc in Mathematics; Grade: Cum Laude (top < 2%) — Sept 2021 – June 2024

- Pursued the Honors Program with an additional 30 ECTS in advanced Computer Science courses.
- Relevant courses @VU: Bayesian Statistics, Dynamical Systems, Topology, Complex Analysis, Fourier Analysis, Multivariable Calculus, Group Theory.

Nanyang Technological University, NTU — Singapore, Singapore
Exchange Semester in Artificial Intelligence — Aug 2023 – Dec 2023

- GLOBE scholar - Merit-based scholarship.
- Coursework @NTU: Algorithm Design & Analysis, Machine Learning, Neural Network & Deep Learning, Natural Language Processing, Modelling & Control.

RESEARCH EXPERIENCE

Centre de Recerca Matemàtica, CRM — Barcelona, Spain
Bachelor's Thesis research supervised by Dr. Alexander Roxin — Feb 2024 – Aug 2024

- Researched how variability in synaptic connectivity can enhance the memory storage capabilities of recurrent neural networks (CA3 region of the hippocampus).
- Code available at github.com/antoniofrancaib and project available here.

Vrije Universiteit Amsterdam, VU — Amsterdam, Netherlands
Independent Research project supervised by Prof. Daniele Avitabile. — Feb 2023 - June 2023

- Researched Amari's equations to simulate spatial firing patterns across neural fields, exploring their stability and dynamics in depicting cortical activity.
- Project report available here.

Center for AI Safety, CAIS — San Francisco, CA (remote)
Machine Learning Safety Scholar — Jun 2022 – Sept 2022

- Completed online courses from MIT and the University of Michigan, along with a new course on Introduction to ML Safety.
- Final project on the emergence of power-seeking AI and its potential existential threat, available here.

Artificial Neural Computing, ANC Miami, FL (remote)
Research Intern supervised by Dr. Vitaly Vanchurin Jan 2022 – May 2022

- Took classes on advanced ML topics, including statistical modeling, thermodynamics, non-equilibrium dynamics, and physics- and bio-inspired algorithms.
- Attended the ANC Journal Club discussing analytical machine learning theory research papers.
- Experimental project on modeling the geometry and evolution of decision boundaries in neural networks.

TEACHING EXPERIENCE

Vrije Universiteit Amsterdam, VU Amsterdam, Netherlands
Teaching Assistant in Probability Theory Feb. 2023 – Jun. 2023
Teaching Assistant in Single Variable Calculus and Linear Algebra Sept. 2022 – Jan. 2023

- Led weekly sessions for 20-40 students, reviewing lectures and assisting with problem sets.

INDUSTRY EXPERIENCE

AltanLabs Barcelona, Spain
Machine Learning Engineer Jan 2024–Present

- Developing NLP and machine learning modules to build a flexible AI framework that enables the development of domain-specific software.

MACHINE LEARNING PROJECTS

Accelerating Molecular Simulation with Neural Networks
Master's thesis supervised by Dr. José Miguel Hernández-Lobato Spring 2025

- Investigating MCMC acceleration techniques for MD by developing diffusion models and energy-based samplers to generate equilibrium molecular configurations with improved sampling efficiency.

gRNAdeX: 3D RNA Design with Geometric Deep Learning
Research project for the Geometric Deep Learning class (L65) at Cambridge University Spring 2025

- Proposed gRNAdeX, an improved version of gRNAde, incorporating better geometric expressivity, universal representation, and sampling robustness. Code.

Segmenting Glomeruli Functional Tissue Units
Final project for the Machine Learning class (CZ4041) at NTU Singapore Fall 2023

- Developed and optimized a U-Net-based segmentation process for precise identification and analysis of Glomeruli Functional Tissue Units in kidney tissues. Code | Project.

Cross-Domain Sentiment Classification with Domain-Adaptive Neural Networks
Project for the Deep Learning & Neural Networks class (CZ4042) at NTU Singapore Fall 2023

- Implemented a novel Adversarial Domain Adaptation (ADA) approach for Cross-Domain Sentiment Classification (CDSC) that enhances model robustness across diverse domains. Project.

OUTREACH AND SERVICE

Menú Por El Planeta (non-profit) Barcelona, Spain
Co-Founder Sept 2019–Jun 2021

- Non-profit organization that assists Spanish universities in transitioning to a more sustainable food offer.
- Responsible for fund-raising, organisation, supervision of employees and strategic decisions.
- Supported by grants from VegFund, Animal Charity Evaluators, and ProVeg.

Estudiante Por Los Animales Barcelona, Spain
Co-Organizer Jan 2019–Jun 2020

- Organized talks, conferences, and group readings to promote the moral consideration of non-human animals.

SELECTED HONORS

- **Nova 111 Student List** 2025
  Recognized among the Top 10 students under 25 in Mathematics, Data Analytics and Physics in Spain as part of the Nova 111 Student List 2025. Details
- **Cum Laude Distinction** 2024
  Graduated in the top 2% of my cohort in the BSc program in Mathematics.
- **CRM Fellowship Award** 2024
  Awarded a grant to conduct undergraduate research in computational neuroscience under the supervision of Dr. Alexander Roxin. €1k of total financial support.
- **GLOBE scholarship (top $< 1\%$)** 2023
  This scholarship is intended for talented students who want to study at a partner institution. Awarded to 10 students (out of ∼1000 applicants) within VU Amsterdam. €5k of funding for living expenses
- **Honorable Mention at AI Safety Public Materials Bounty.** 2023
  $1K award for my blog post Power-Seeking AI and Existential Risk, published on LessWrong.
- **Long-Term Future Fund, LTFF** 2022
  $2K scholarship for pursuing projects related to ML awarded by Open Philanthropy Project.
- **Machine Learning Safety Scholarship** 2022
  $5K stipend to complete ML courses from MIT and the University of Michigan
- **Science Immersion Program in Mathematics** 2018
  Scholarship awarded by Spanish Science Ministry for outstanding academic achievements, enabling attendance at university-level courses in physics and mathematics while still in high school.

SKILLS

Languages

- **Spanish** - mother tongue
- **English** - professional proficiency
- **Italian** - professional proficiency
- **Chinese** - beginner

Programming Languages

- *Python, Javascript, C, C++, Scala, Spark, Kotlin, SQL, HTML, CUDA, VHDL, MIPS assembly*
- *ML libraries: Pytorch, JAX, TensorFlow, Pytorch Lightning, Weights and Biases*
- *Neural Network Simulation Tools: NEST, Brian, NEURON*