

## EDUCATION

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### University of Cambridge

*MPhil in Machine Learning and Machine Intelligence*

Cambridge, England

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

*BSc in Mathematics; Grade: Cum Laude (top < 2%)*

Amsterdam, Netherlands

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

*Exchange Semester in Artificial Intelligence*

Singapore, Singapore

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

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### Centre de Recerca Matemàtica, CRM

*Bachelor's Thesis research supervised by Dr. Alexander Roxin*

Barcelona, Spain

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](https://github.com/antoniofrancaib) and project available here.

### Vrije Universiteit Amsterdam, VU

*Independent Research project supervised by Prof. Daniele Avitabile.*

Amsterdam, Netherlands

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.

**Artificial Neural Computing, ANC**  
*Research Intern supervised by Dr. Vitaly Vanchurin*

Miami, FL (remote)  
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 the boundary dynamics of neural networks.

**Center for AI Safety, CAIS**  
*Machine Learning Safety Scholar*

San Francisco, CA (remote)  
Jun 2021 – Sept 2021

- 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.

## TEACHING EXPERIENCE

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**Vrije Universiteit Amsterdam, VU**  
*Teaching Assistant in Probability Theory*  
*Teaching Assistant in Single Variable Calculus and Linear Algebra*

Amsterdam, Netherlands  
Feb. 2023 – Jun. 2023  
Sept. 2022 – Jan. 2023

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

## LEADERSHIP EXPERIENCE

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**Altan.ai**  
*Founding Engineer*

Barcelona, Spain  
Jan 2022–January 2023

- Developed a multi-armed bandit algorithm for budget optimization for a marketing agency client and built a platform for easy chatbot integration on websites.

## MACHINE LEARNING PROJECTS

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**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 available at [github.com/antoniofrancaib](https://github.com/antoniofrancaib) and project available here.

**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 report available here.

## OUTREACH AND SERVICE

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### Menú Por El Planeta (non-profit)

*Co-Founder*

Barcelona, Spain

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

*Co-Organizer*

Barcelona, Spain

Jan 2019–Jun 2020

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

## SELECTED HONORS

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- **Cum Laude Distinction** 2024  
Graduated in the top 2% of my cohort in the BSc program in Mathematics.
- **CRM Fellowship Award** 2024  
I was awarded a grant to conduct undergraduate research in computational neuroscience under the supervision of Dr. Alexander Roxin.
- **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.
- **Honorable Mention at AI Safety Public Materials Bounty.** 2023  
I received an award for my blog post "Power-Seeking AI and Existential Risk".
- **Long-Term Future Fund, LTFF** 2022  
Personal Grant for projects relating to Machine Learning awarded by Open Philanthropy Project.
- **Science Immersion Program in Mathematics** 2018  
Scholarship awarded by Spanish Science Ministry for outstanding academic achievements during high school.

## SKILLS

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### 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*