

Eric Alcaide Medicine & Physics Student, Machine Learning

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Skills

Multi-Language Coding

Python, Julia, Bash, JavaScript, C++, Web, Scientific computing, Numerical computing frameworks (TensorFlow, Pytorch, Numba, etc)

Cloud & HPC

Algorithmic optimization, CPU and GPU parallelism, server and cluster computing

Machine Learning

Geometric deep learning, computer vision, natural language, clustering, graphs, self-supervised learning, etc

Teamwork,

Public Speaking,
Fast Prototyping,
Problem Solving

Professional / Research Experience

09/2021 – present

Translational Scientist, CHARM Therapeutics

From Bits to Molecules

Everything in between: geometric deep learning research, model evaluation, target research, data pipeline engineering, virtual screening, etc.

01/2021 – present

Open Source Researcher, EleutherAI, OpenBioML

Research at the intersection of Natural Language Processing, Structural Biology and High-Performance Computational Methods.

12/2020 – 01/2022

Machine Learning Researcher, VIR Biotechnology

Research in Machine Learning for Structural Biology. Geometric Deep Learning and Natural Language Processing techniques for organic molecules, proteins and monoclonal Antibodies (mAbs).

2019 – 2021

Private Machine Learning Tutor

Personalized advice to Masters' students from different backgrounds (from Computational Linguistics to Biomedical Engineering) on Text Classification, Image processing and Information representation. Advised how to carry out Masters' Thesis-level projects.

2019

Non-Profit Health Hackathon Mentor, TV3 - La Marató

Advised and assisted teams developing healthcare and scientific projects with a strong algorithmic component, including genetic clustering and protein conformational changes.

Papers & PrePrints

2022

Relevance of myocardial injury biomarkers to the prognosis of COVID-19 patients,

Revista Española de Cardiología

COVID19 related revision of predictive power of myocardial injury biomarkers (NT-proBNP and hs-TnT) regarding Mechanical Ventilation and Death Events.

2021

MP-NeRF: Massively Parallel Natural Extension of Reference Frame,

Journal of Computational Chemistry

Massively Parallel version of the Natural Extension of Reference Frame for folding polymers (proteins, RNA, ...) based on internal angles. Achieved 1000x speedups against previous state of the art. Usage in MD simulations and Machine Learning training.

2020

Improving Graph Property Prediction with Generalized Readout Functions, *ArXiv*

Preprint proposing generalized mean-max-sum aggregation functions for the readout phase in message-passing graph neural networks.

2018

E-swish: Adjusting Activations to Different Network Depths, *ArXiv*

PrePrint proposing a new activation function called E-Swish which showed state of the art results in several computer vision benchmarks.




Education

09/2020 – 06/2024 Barcelona, Spain	Physics Degree , <i>University of Barcelona</i> Physics Degree
09/2018 – 06/2024 Barcelona, Spain	Medical Degree , <i>University of Barcelona</i> Medical Degree. Multiple distinctions.

Courses

2020 – 2020 Barcelona, Spain	HPC-based Computational Biomedicine , <i>Barcelona Supercomputing Centre</i> Impact and Hands-on experience of applied supercomputing to biomedical problems (molecular simulations, genomic analysis, tissue modelling, etc.)
2018 – 2019	Deep Learning, Natural Language Processing and AI for Medicine Specializations , <i>Coursera</i> Contents include: foundations of Deep Learning, project management, Computer Vision, sequential data, Natural Language Processing, AI in healthcare, etc
01/2017 – 05/2017	Artificial Intelligence Micromasters Program , <i>Columbia University</i> CSMM.101x: Artificial Intelligence (AI) - (through edx.org). Average qualification: 8.1 / 10 Search methods, games, ML introduction, CSPs, NLP, robotics introduction, etc.

Projects

2018 – present	Open Source projects Projects and modules for scientific computing which recieved a high degree of community acceptance: <ul style="list-style-type: none">• 2021: AlphaFold2 open replication : Main contributor to the Open Source effort for the replication (and improvement) of the AlphaFold2 architecture (state of the art, deep learning engine for protein structure prediction).• 2021: Geometric Vector Perceptron : Implementation of a Graph Neural Network architecture capable of handling 3D geometry.• 2021: E(n) Equivariant GNN:  Graph Neural Network architecture which works on invariant representations in arbitrary dimensions.• 2019: MiniFold:  Predict protein foldings from raw sequences (AlphaFold v1 imitation).• 2018: Keras-WRN:  A package of Wide Residual Networks for image recognition in Keras. Open Source Contributions Contributions to cutting-edge Open Source Software packages (Pytorch Geometric, Fastformers, etc)
2017	Deep Learning - Can Computers Learn? Research project focused on the AI and Deep Learning field, subfields and the state of the art techniques. <ul style="list-style-type: none">• Evolutionary Strategies for architecture optimization in Neural Networks.

Languages

Spanish Native	Catalan Native	English C2 level
German B1 level	Mandarin HSK 1-2 level	

Awards

2019	ESADE - Accenture HealthHackathon Winnner Award , <i>ESADE, Barcelona</i>
2019	AlphaFold v1 Replication Contest Award , <i>Nvidia Titan RTX, Nvidia</i>
2017	Hackathon UPC Winner Award , <i>HackUPC, Barcelona</i>