

Nicolás Vila

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SUMMARY

I am a recent graduate with a Bachelor of Engineering from Universitat Pompeu Fabra, where I graduated at the top of my class. As a machine learning engineer with a strong technical background, my research interests focus on reinforcement learning, optimal control, and the development of AI models capable of reasoning and acting across various applications. I am passionate about leveraging deep learning techniques to address and solve such complex problems.

WORK EXPERIENCE

Data Engineer Intern, Amazon EU

Jun 2023 - Oct 2023 (Barcelona, Spain)

- Part of the Data Engineering team at ATS (Amazon Transportation Services) which handles data pipelines used by a range of different internal teams.
- Developed a data analytics pipeline on AWS to deploy dashboards and create automatic alerts from real-time data stored in an RDS Database.

ML Research Assistant, University of Chicago Law School

Mar 2023 - Oct 2023 (Chicago, IL)

- Worked with OpenAI's API and fine-tuned open source Large Language Model LLaMa-v2 for automatic text generation in the realm of Law.
- Developed an AI system capable of drafting appellate legal briefs, worked with a team of attorneys to define methodologies and strategies.

Data Science Clinic Student, Greenwave

Jan 2023 - Mar 2023 (Chicago, IL)

- Research and implementation of computer vision models deployed on a distributed cluster to predict the mass of kelp from images.

EDUCATION

2020 - 2024	Bachelor's Degree at Universitat Pompeu Fabra Mathematical Engineering on Data Science, <i>Graduated first in class</i> Thesis: Regularized Deep Reinforcement Learning from a Linear Programming Perspective Honors: Numerical Methods, Machine Learning, Signals & Systems I, Probability, Operating Systems, Cryptography, Entrepreneurship in Technology	(GPA: 8.85/10.0)
2022 - 2023	Exchange student at The University of Chicago Coursework: Time Dependent Data, Introduction to Cryptography, Introduction to Quantum Computing, Data Science Clinic, Entrepreneurship in Technology, Multivariate Statistical Analysis, Introduction to Database Systems.	(GPA: 3.5/4.0)
2023	University of Chicago Booth School of Business Coursework: Big Data.	
2022	Toyota Technological Institute at Chicago (TTIC) Coursework: Fundamentals of Deep Learning.	

PROJECTS

Entropy-Regularized Deep RL with Linear Programming

[Link to code](#)

Developed a practical implementation of Q-REPS using deep neural networks (DNNs). Performed a large-scale empirical study using a distributed cluster to understand the impact of various practical design choices. Developed a novel primal-dual policy iteration algorithm and tested it in a tabular setting. (**PyTorch, Gymnasium**)

Hierarchical Deep Learning Model for Time Series Anomaly Detection

[Link to demo](#)

Developed and trained a Transformer-LSTM based hierarchical model for anomaly detection, consumption pattern recognition and prediction using daily water consumption time series data recorded from 2019 to 2022. (**Pytorch, Streamlit**)

VQ-VAE Paper Extension

[Link to demo](#)

A modification of the VQ-VAE (Vector-Quantised Variational Auto-Encoder) paper decreasing by a half the reconstruction error. (**PyTorch**)

Analytics WebApp with ML and explainable AI for car price prediction[Link to demo](#)

Developed a WebApp that features data analysis and incorporates a predictive model trained using LightGBM on automobile data. The application also includes a model explainability section to interpret the model’s performance.(**Scikit-Learn**, **Streamlit**)

LEADERSHIP & ACTIVITIES

- Finalist in the 2023 AB Data Challenge**Dec 2024 (Barcelona, Spain)
- Our Hierarchical DL model predicted water consumption and detected over 50k anomalies.
- Contestant at the 2022 ICPC SWERC**Apr 2022 (Barcelona, Spain)
- Solved several competitive programming problems representing UPF.
- Finalist of the “Big Data Challenge” by “CaixaBank”**Mar 2018 (Barcelona, Spain)
- One of the 10 finalists in a nation-wide contest organised by CaixaBank. Participated in the final dataton in Barcelona, Spain.

SKILLS & LANGUAGES

Technical Skills	Python, PyTorch, C, C++, Java, JavaScript, Matlab, R, Docker, Git, Linux, SQL, AWS, Spark, Huggingface, Gymnasium
Languages	Spanish (Native), English (C1) and Catalan (Native).