

Nicolás Vila

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SUMMARY

I am a recently graduated machine learning engineer with a strong technical orientation. My research interests include reinforcement learning, optimal control, and developing AI models that can reason and act. I am passionate about applying deep learning techniques to solve 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** (GPA: 8.8/10.0)
Mathematical Engineering on Data Science
Thesis: Regularized Deep Reinforcement Learning from a Linear Programming Perspective
Honors: Numerical Methods, Machine Learning, Signals & Systems I, Probability, Operating Systems

2022 - 2023 Exchange student at **The University of Chicago** (GPA: 3.5/4.0)
Coursework: Time Dependent Data, Introduction to Cryptography, Introduction to Quantum Computing, Data Science Clinic, Entrepreneurship in Technology, Multivariate Statistical Analysis, Introduction to Database Systems.

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).