

VÍCTOR JIMÉNEZ RODRÍGUEZ

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SUMMARY

Machine learning engineer with a background in physics and statistics, and a proven track record in both academic and industrial environments. Currently looking for a research internship position to contribute to exciting projects in machine learning and computational science.

EXPERIENCE

Uthereal – ETH AI Center (Zurich) *Since Jan. 2024*
Machine learning engineer

- Involved in the implementation of a full-scale information retrieval system for RAG. Worked on OCR, document feature engineering, entity recognition, knowledge graph generation, sparse and dense embedding search, and explainability.
- Built end-to-end ML experimental framework for RAG pipeline evaluation and benchmarking inspired in Pytorch Lightning, including automatic logging with Weave (Weights & Biases).

Institute for Machine Learning – ETH (Zurich) *Oct. 2023 – Sep. 2024*
Research traineeship – Prof. Dr. Joachim M. Buhmann

- Master's thesis with Honors. Candidate for the ETH Medal in CS. – *Improved robustness of deep learning models through posterior agreement based model selection.*
- Manuscript derived from the thesis currently under submission for publication.

Physics of Energy Conversion and Storage – TUM (Munich) *Feb. 2022 – Oct. 2022*
Research traineeship – Prof. Dr. Aliaksandr Bandarenka

- Bachelor's thesis with Honors – *EIS characterization of lithiated TiO₂-coated LICGC electrolytes for the stabilization of the SEI in all-solid-state lithium batteries.*
- Contributed to *Characterization of the Lithium/Solid Electrolyte Interface in the Presence of Nanometer-thin TiO_x Layers for All-Solid-State Batteries – A. Bandarenka, et al. ChemSusChem 2024, e202401026.*

EDUCATION

Master's degree in Statistics and Operations Research *2022 – 2024*
Facultat de Matemàtiques i Estadística – UPC (Barcelona)

Completed track in statistical inference, optimization theory and machine learning. [9.05/10]

Bachelor's degree in Engineering Physics *2018 – 2022*
ETSETB – UPC (Barcelona)

Elective coursework included computational electromagnetism, advanced materials, numerical simulation of condensed matter, quantum computing and optical technologies, photonics, and computational biophysics. Engineering coursework included control theory, signal processing, and antennas.

Top 0.1% students – PAU official exams *2018*

Scientific-Technological Baccalaureate with Honors *2016 – 2018*
Maristes Sants-Les Corts, Barcelona

LANGUAGES

Catalan, Spanish	Native
English	Proficient
German	Intermediate

PROGRAMMING

Python	Machine learning, data analysis, computational physics. <i>Pytorch, Pytorch Lightning, Weights & Biases, ...</i>
R	Statistics, frequentist inference, statistical learning
MATLAB	Numerical methods for mathematics and physics, signal processing, linear systems theory, optimization (IPM).
AMPL	LP, IP and MILP problems, stochastic programming.
Stan	Bayesian analysis.
Scala	FOOP, Spark RDDs.
SAS	Statistical data analysis.
Fortran	MD and MC simulations, VMD visualization.
C & C++	Analog and digital circuit control.

OTHER PROJECTS

Erasmus ULISSES Ideathon – UL (Lisbon)	<i>Jul. 2023</i>
Three-week intensive ideathon aimed at addressing an ocean sustainability challenge.	
Lasso and Bayes – A demonstration using real estate market data	<i>2023</i>
Bayesian analysis.	
Modelling and design of a Paul Ion Trap	<i>2021</i>
Computational electromagnetism, finite element method, EM momentum method.	
Calcium-mediated regulation of astrocytes response in the brain	<i>2021</i>
Computational biophysics, dynamical systems modelling.	
Design and implementation of a sound recorder, processor and player in the electronics laboratory. TD-PSOLA and Phase Vocoder algorithms in a STM32 microprocessor.	<i>2021</i>
Electronics, signal processing, analog and digital circuits, PWM conversion.	
Quantum Key Distribution in free-space-link communication systems. BB84 protocol implementation for earth-satellite communication.	<i>2018</i>
Quantum physics, cryptography, free-space communication.	