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

- Developed a full-scale agentic information retrieval system (A-RAG), integrating OCR, document feature engineering, keyword modeling, knowledge graph generation, hybrid embedding search, chain-of-thought reasoning, and explainability.
- Contributed to an industrial-academic partnership Innosuisse grant application, focusing on the integration of A-RAG in the medical domain. The grant was awarded CHF 980,000.
- Designed and co-supervised thesis and semester projects for ETH master's students, including research initiatives linked to the Innosuisse grant.
- Built an end-to-end ML experimental framework for A-RAG pipeline evaluation and benchmarking. Integrated Pydantic framework with configuration-based instantiation, AWS deployment, and W&B logging for streamlined experimentation and reproducibility.

Institute for Machine Learning – ETH (Zurich) *Nov. 2023 – Sep. 2024*
Research traineeship – Prof. Dr. Joachim M. Buhmann
Improved robustness of deep learning models through posterior agreement based model selection.

Master's thesis with Honors. Candidate for the ETH Medal in CS. 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
EIS characterization of lithiated TiO_2-coated LICGC electrolytes for the stabilization of the SEI in all-solid-state lithium batteries.

Bachelor's thesis with Honors. Contributed to published work: *Characterization of the Lithium/Solid Electrolyte Interface in the Presence of Nanometer-thin TiOx 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 courses covered control theory, signal processing, and antenna design.

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. *Pytorch, Pytorch Lightning, Weights & Biases, ...*
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 optimization, 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) *Jul. 2023*
Three-week intensive ideathon aimed at addressing an ocean sustainability challenge.

Lasso and Bayes – A demostration using real estate market data *2023*
Bayesian analysis.

Modelling and design of a Paul Ion Trap *2021*
Computational electromagnetism, finite element method, EM momentum method.

Calcium-mediated regulation of astrocytes response in the brain *2021*
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. *2021*
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. *2018*
Quantum physics, cryptography, free-space communication.