

CHRISTIAN DORADO

PHYSICS GRADUATE

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OBJECTIVE

I am a physics graduate with background in Machine Learning research, passionate about leveraging data-driven insights. My general interests are healthcare related, with experience in medical device innovation and partaking in building and designing a machine learning-driven infusion monitoring system designed to detect insulin infusion set failures (ISF) in real-time. +2 years of research experience in the healthcare field. Aiming to bring a Data Scientist's practical and collaborative approach to the development of cutting-edge AI solutions. Looking for a challenge to get involved with, to grow my career and expand my skill set.

EXPERIENCE

March 2024 – April 2025

Lead Data Science Research Visitor

University of Houston (Texas, USA) & Diatech Diabetes

Integrated large-scale metabolic models of glucose dynamics with pump force mechanics to improve diabetes management. Real patient data was analyzed using machine learning to detect system failures, enhancing safety and reliability. A user-friendly tool was developed for real-time failure analysis and predictive trend detection.

Research:

- Explored lightweight algorithm configurations optimized for deployment in embedded systems.
- Analyzed and cleaned a dataset from a study involving 40 patients, including glucose levels, insulin intake, and force sensor data.
- Conducted an extensive review of the latest research on diabetes management and trend evaluation. Applied various methodologies from renowned papers to the dataset.
- Conducted large-scale parallel computations on University of Houston's Hewlett Packard HPC using SLURM for job scheduling, Bash for automation, and MPI for distributed computing.

Results:

- Developed a tagging system that specifies the infusion status as normal, occlusion (partial or full) or leak/dislodgement.
- Created a dynamic alarming system capable of detecting infusion failures in real-time.
- Improved time-to-detection of infusion failures by 3-9 hours compared to state-of-the-art methods.

Obtained Skills: Startup Machine Learning/Data Science Efforts Lead, Statistical Analysis & Inference, Time Series, .JSON, Predictive Modelling, Clinical Data, ETL, MPI, SLURM & Bash, Excel, Programming Software (and visualizers), Tableau, Decision taking, Medtech innovation, Bench Testing, Research Group Participation.

2021 - 2022

Bachelor's Thesis in Machine Learning

University of the Basque Country (UPV)

Bachelor Thesis aimed at the "Activity Prediction for Intermediate Conductance Calcium-Activated Potassium Channel Inhibitors using Random Forest". Gaining experience as part of the research group by modeling an algorithm to the research, fostering collaborative skills and getting exposed to diverse scientific methodologies.

Research:

- Part of a multidisciplinary team, primarily composed of biochemists and physicists, focused on identifying drugs that influence potassium channel inhibition for the treatment of ALS, epilepsy, and other neurological disorders.
- Developed a bank of 178 molecules, each with 76 features of interest, and improved SVM and simpler regression models to predict **IC50** (the concentration required to inhibit potassium channels), achieving over 83% accuracy within the acceptable error range for related Gibbs free energy. Reduced errors in simpler regressors by up to 20% for IC50 calculations.
- Utilized SMILES strings and developed clustering algorithms to model different molecular shapes.

Academia:

- Authored and presented a dissertation in English, introducing research findings to a panel of four physicists.
- Achieved an overall grade of 80%.

Impact:

The developed model is being applied for predicting IC50 in conjunction with simulation environments like Rosetta to further evaluate market-available candidate drugs.

Obtained Skills: Dataset Management, EDA, Analytical Skills, A/B Testing, Programming Tools and Software (Pandas, Matplotlib, Scikit-learn...), Supervised/Unsupervised ML techniques, Feature Engineering (PCA, Clustering), GitHub, Research Group Participation.

EDUCATION

2017 - 2022

B.Sc. Physics

University of the Basque Country (UPV)

Academic journey in a challenging university environment. Independently pursued a Bachelor's thesis in Machine Learning, underlining personal dedication to the intersection of physics and AI.

2015 - 2016

Academic Year in Canada

Central High Sedgewick Public School

Grade 11 in Canadian High School. Accumulated work experience, engaging in teaching roles for children and contributing as a volunteer Spanish instructor. An experience where not only language and communication skills were developed, but also personal growth. Physics SAT taken, ranking highest in High School (91%).

AWARDS

IMFAHE FSS FELLOWSHIP- Houston, USA

December 2023

Awardee of an international fellowship to do a six-month internship.

FUNDACION AMANCIO ORTEGA SCHOLARSHIP- Alberta, Canada

June 2015

Granted Scholarship to course Grade 11 in Canada. Selected 200 students from 12.000 applicant pool.

BASQUE GOVERNMENT GRANT- Oxford, United Kingdom

July 2013

Basque Government Grant to spend a month being taught English in Great Britain.

LANGUAGES & SOFTWARE SKILLS

Languages: English (IELTS (8), CERTIFICATE IN ADVANCED ENGLISH C1), Basque C1 (native), Spanish (native).

Programming Skills: Good command of Python, Matlab and Linux; Mathematica knowledge

- Machine Learning Course by Stanford University Online.
Coursed 60 hours and further read books on the subject to apply to Thesis research.
Obtained overall performance of 98.7%.
- Fundamentals of Deep Learning by NVIDIA Deep Learning Institute.
Coursed 8 hours workshop on TensorFlow sponsored by the University of Houston.
- The Complete SQL Bootcamp: Go from Zero to Hero
- Deep Learning Specialization by DeepLearning.AI
Coursed 125 hours and completed all assignments outstandingly.

Course & self-guided learning overview:

- Understanding of supervised/unsupervised ML algorithms and the mathematical/programming base.
- Comprehension of Deep Learning and the mathematical/programming base.
- Most important libraries in data science: Pandas, Scikit-learn, TensorFlow, NumPy, SciPy.
- Deep Learning architecture programming (CNN, RNN, LSTM...).
- Command of SQL in the PostgreSQL variant.

MORE COURSES & EXPERIENCE

More Courses:

HCS 3000: Workplace Safety Systems

Leisure and Free Time Monitor + First Aid (Double Certification) (210h)

Driver's License

More Experience & Volunteering:

Private tutor for minors in foster care at ADARRA Pedagogical Institution, subsidized by the Bizkaia Provincial Council.

Volunteering as Spanish Teacher in Canadian Youth Center.