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Juan López-Ríos

Data Scientist / Junior Developer

Portfolio: Juan Website
github.com/uvezero
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Education

University College London (UCL)
MSci, Theoretical Physics **Sep 2020 — May 2024**
Grade: First Class Honours
Thesis:
BSc: *"Smartphone-Based Fundoscopy: Leveraging Machine Learning for Enhanced Retinal Condition Detection"*
MSc: *"Machine Learning-Driven Identification of Optimal Ligands for Restoring RAS Protein Function in Biocatalysis"*

Technical Skills

Tools and Languages	Wolfram Mathematica, **Python**, LaTeX, Docker, MLflow, Mage, Langchain
Certifications	Machine Learning with Python (Freecodecamp), MLOps zoomcamp (DataTalksClub)
Communication	English, Spanish, Japanese (A1)

Work Experience

Research Intern **Sep 2023 — May 2024**
University College London (UCL) *London, UK*

- Conducted data collection, processing, and feature engineering pipelines with **Python**, creating 85% of the top 20 features and boosting predictive capabilities by 0.2 Pearson correlation. Thesis awarded first class honours (80% grade).
- Developed machine learning models to identify optimal ligands from over 10,000 candidates for reactivating hydrolysis in oncogenic Ras-mutated proteins.
- Produced a reliable predictive model for unseen ligands, achieving a 0.5 increase in Pearson correlation, enhancing the model's accuracy and predictive capability.
- Developed a dataset with 1,018 newly engineered features, integrating insights from prior and original research using **RDKit**, **PyMol**, and equilibrium simulations. Accelerated research projects and contributed to a paper under review.

Machine Learning Intern **May 2023 — July 2023**
Encord *London, UK*

- Analyzed the SAM model and discovered that training its fine-tuned version on a mean average mask improved segmentation accuracy for 20+ specific objects, enhancing detection performance and accelerating project timelines.
- Evaluated Per-SAM and Mask R-CNN on segmentation tasks in the DeepFashion dataset, where Per-SAM achieved a mAP of 0.501, significantly outperforming Mask R-CNN. Published the results in a blog post on the Encord website.
- Designed and built a **Python-based** chatbot using **Langchain** and **APIs** to aid navigation and product understanding on Encord's platform by retrieving information from 3 different Encord sources, demonstrating potential to enhance user satisfaction.

Research Intern **May 2021 — June 2021**
King's College London *London, UK*

- Modeled Molecular Dynamics (MD) simulations to study the digitization and behavior of small biomolecules and examined the results using the **MDAnalysis** package, improving proficiency in **Python**.

Hackathons & Awards

- **Optiver Hackathon** (Team Lead) **— Nov 2023**
  - Led a team to develop a trading algorithm from scratch using machine learning and **Python**, primarily responsible for designing and implementing core components to optimize stock trades based on liquidity, volatility, and spreads.
  - Advanced to the final stage, ranking in the top 5 out of 25 teams in the hackathon.
- **LLM Challenge** (Developer) **— June 2023**
  - Conceived and designed a chatbot for Encord during a hackathon, quickly developing a tool to guide customers and provide detailed product information, and presented it to the department.
- **Physics Department BSc Final Project Presentation** — 2nd Place **— March 2023**