Ana PRIETO NEMESIO

Senior Data Scientist | Computer Vision

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EXPERIENCE

Computer Vision Scientist

Cervest

10/2021 – Ongoing | Remote, Spain

As a data scientist specialised in Computer Vision, I contribute to developing physical climate-related signals for asset risk quantification. I have led the technical implementation of a global in-house digital terrain model for flooding applications, empowered by the fusion of multiple remote-sensing satellite data with a DL model. Additionally, I provide support as ML Subject Matter Expert to other workstreams, such as wildfire. Key responsibilities:

- Designed and led the implementation of a scientifically robust methodology and the timely delivery of the data to the stakeholders.
- Coordinated team of up to 4 members across the different stages of the product implementation: prototyping, scaling, and deployment.
- Collaborated with other team leads to envisage new initiatives to improve the product, making sure the product roadmap adapts to the business needs.
- Support company planning about the identification of new opportunities where ML can boost our climate science by providing additional business value (i.e., Computational performance, spatiotemporal resolution, etc.)
- Contributed to the technical implementation of a wildfire intensity signal to model projections of future fire risk under different climate scenarios. Curated multi-modal dataset fusing historical climate data from ERA5, remote sensing, LULC and terrain data.

Machine Learning Engineer

GMV NSL

09/2019 – 10/2021 | Harwell, UK

In my role as ML Engineer at GMV NSL Space division, I worked on research projects that looked at achieving scientific and technological advances by combining deep learning and space assets. The project portfolio included EO applications, GNSS Systems, Weather Nowcasting, and Smart Railway Gauging. Core technical skills gained:

- Collaborated with subject matter experts to better understand how DL can be applied in a particular scientific field.
- Worked with large datasets such as satellite multispectral imagery datasets (Sentinel 2, GOES, GPM Constellations), GNSS Datasets, and 3D Point Cloud LIDAR Data.
- Participated in the preparation of technical proposals for different organizations (ESA, EC): perform trade-off analysis of technical solutions, drafting of the system requirements, and Architecture Diagrams.
- Coordinates stakeholders' meetings for successful project delivery and led milestone check-ins to provide stakeholders guidance on the use of our models and updates on the progress.

EDUCATION

MSc Adv. Computational Methods for Aeronautics, Flow Management, and Fluid-Structure Interaction

Imperial College London | Distinction Awarded
09/2018 – 09/2019 | London, UK

- Thesis: "Analysis of the Turbulent /Non-Turbulent Interface of the Axisymmetric Turbulent Wakes generated by a Fractal and a Square Plate". Received training and used the UK HPC Supercomputer, ARCHER, and the research high-order flow solver, Incompact3d, to conduct the simulation.

Bachelor´s Degree in Aerospace Engineering. Aerospace Vehicles Specialization

Univ. Politécnica de Madrid. | 2:1 Awarded
09/2013 – 09/2018 | Madrid, Spain

LANGUAGES

Spanish
Native Speaker

English
Advanced

French
Basic

INTERESTS

Drawing | Running
Traveling | Reading

PROJECTS

Cervest - Digital Terrain Model (DTM)

- Implemented end-to-end ML workflow to build a global Digital Elevation Model that has allowed to correct under-prediction of flood risk in several urban areas and to derive valuable auxiliary information to other work streams.
- Coordinated the development of scalable data pipelines, including geospatial ML data processing workflows and those focused on the inference stage. Pipelines were designed to comply with computational requirements and scalability performance, using Argo CD and Kubernetes.
- Built modeling framework for quick refinement and prototyping, using Pytorch Lightning, Ray Tune, and Mlflow. Carried out parameter tunning of models in parallel using multiple GPU and multi-CPUs in-house servers.
- Architected bespoke attention based UNet model to produce high-quality terrain reconstructions.
- Carried out model evaluation and error quantification including relative and absolute uncertainty quantification using reference datasets like regional Lidars and Icesat-2 data.
- Participated in Knowledge Sharing sessions to explain the technical details behind the scientific development of the DTM and to help other colleagues learn about the field of AI and its application to earth science.

HYMS – Hyperspectral Microwave Sensor

NSIP - UKSA

- Conducted research study to show the potential behind the use of microwave satellite data for precipitation nowcasting applications as well identification of meteorological datasets suitable for this.
- Implemented Unet Network using SEVIR benchmark dataset that combined spatio-temporal data coming from multiple weather sensors (radar, satellite data (visible, infrared, microwave).

BIGMIG-DEMO –

Space-based Big Data for forced migration prevention

ESA ARTES IAP

- Contributed to development of a Land Use Land Cover Map using Random Forest Model, achieving classification of 7 different classes.
- Developed ConvLSTM Deep Learning Model for a crop classification of smallholder agriculture using multispectral satellite imagery from Sentine 2. Achieved classification of 3 different type of crops (beans, sesame, vegetables) and automatic learning of cloud masking.
- Work accepted for presentation and delivered at the 2019 ESA Phi Week, and the 1st AI for Copernicus workshop at ECMWF, (Reading).

SKILLS

Python | Fortran | Matlab | C++ | Windows | Linux | Mac OS | Git | Airflow | Docker | VSCode | AWS CLI | Gitlab CI | Argo CD | Mlflow | QGIS | Scikit-Learn | Pytorch | Ray-Tune | Streamlit | Jupyter | GDAL | Xarray | Plotly | GeoPandas | Shapely | Laspy | Rasterio | SHAP | Time-Series Modelling | Object Identification | Regressior | Pystac | Agile | Dask | Open3d | CUDA

COURSES

Machine Learning in Weather and Climate

IFAB & ECMWF

09/01/2023 – 04/2023

FSDL 2022

Full Stack Deep Learning

09/2022 – 10/2022

- Implemented app for 3D Reconstruction from panoramic images based on HorizonNet model.
- Architecture deployment into AWS, including frontend server using EC2 instances and API of the trained deep model using AWS Lambda
- Front-end design using Gradio

Artificial Intelligence for Earth Monitoring

EUMETSAT & ECMWF

12/2021 – 01/2022

Machine Learning Specialization

Deeplearning.ai

04/2021 – 07/2021