

Francisco Mesquita *ML Engineer and Researcher*

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Skills

Languages

Portuguese (native), English (upper intermediate - B2)

Programming Languages

Python, SQL, C#

Programming Frameworks / Libraries

TensorFlow, OpenCV, Scikit-learn, HuggingFace, PyCaret, Gradio, Pandas, Numpy, Matplotlib, Seaborn

Technologies

Machine Learning (ML), Deep Learning (DL), Explainable AI (XAI), Computer Vision, OCR, Docker, Git

Professional Experience

Machine Learning Engineer, *Flawless Workflow*

Application of AI methods in diverse products, projects, and process automation. Utilization of Large Language Models (LLMs) for text summarization and interpretation. Development of different product prototypes and participation in projects across multiple business sectors.

05/2024 – present
Remote, Netherlands

Machine Learning Engineer and Researcher, *University of Maia - ISMAI*

As a Data Scientist, I analyze data from the municipality of Maia, implement ML and DL models, and communicate findings. As a Researcher, I focus on the use of machine learning, image processing, and Explainable AI (XAI). Additionally, I participate in the European project OMEGA-X, preparing data for a common European Energy Data Space.

04/2022 – 03/2024
Porto, Portugal

Invited Assistant Professor, *Polytechnic of Coimbra*

Instructed practical sessions within the field of Electrical Circuits, covering various topics such as Ohm's law, electrical power, Kirchhoff's laws, Thévenin's and Norton's theorems, and other concepts.

03/2023 – 08/2023
Coimbra, Portugal

Full Stack Web Developer, *Instituto Pedro Nunes*

Development in a full-stack web application with Angular and .NET framework. Used Technologies: C#, Entity framework, Javascript, KendoUI, Microsoft SQL Server, Azure functions.

09/2021 – 04/2022
Coimbra, Portugal

Scientific Publications

Depression detection using Deep Learning and Natural Language Processing techniques [↗](#)

[F. Mesquita](#), J. Maurício, G. Marques - Springer, CIARP 2023: Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications.

Machine learning techniques to predict the risk of developing diabetic nephropathy [↗](#)

[F. Mesquita](#), J. Bernardino, J. Henriques, JF. Raposo, RT. Ribeiro, S. Paredes - Springer, Journal of Diabetes & Metabolic Disorders.

Predicting Type 2 Diabetes Through Machine Learning: Performance Analysis in Balanced and Imbalanced Data [↗](#)

[F. Mesquita](#), G. Marques - Springer, UNet 2021: International Symposium on Ubiquitous Networking.

Projects

Interpretation of Convolutional Neural Networks (CNNs) [↗](#)

Techniques tested and compared: GradCAM, Lime, Rise, Saliency maps, Anchor explanations, Activation maximization, Occlusion sensitivity, Guided backpropagation and Deep dream.

Interpretable heart disease Machine Learning classifier [↗](#)

Using ML on clinical data to predict heart disease in patients. The best model was the tuned Random Forest with 95.6% accuracy. The SHAP (SHapley Additive exPlanations) method was used to interpret these results.

Real-time drowsiness detection [↗](#)

Computer Vision system using OpenCV and YOLO network to detect drowsiness. It was used a custom dataset with manual image labelling. Transfer learning was used on the foundation model pre-trained on the COCO dataset.

Education

Computer Engineering, intelligent data analysis MSc Degree - 17 values, *Polytechnic of Coimbra*

2021 – 2023

- **Thesis:** Longitudinal ML modeling for Diabetic Nephropathy using data from patients followed for 22 years. Develop an end-to-end ML pipeline encompassing data preprocessing, model training, evaluation, statistical analysis, interpretability (XAI), and deployment. [↗](#)

Computer Engineering BSc Degree - 16 values, *Polytechnic of Coimbra*

2018 – 2021

- **Final project:** Android mobile application serving as a collaborative shopping list, integrating ML methods for real-time product recognition and classification via camera input. [↗](#)