

ANA SOUSA

AI Research Engineer



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City: **Porto, Portugal**
Nationality: **Portuguese**

Summary

I'm an ambitious engineer pursuing my passion and willing to improve. The ideal next step my career would be to contribute to the research/development of technologies that can improve people's lives. I really value being in an international/diverse and innovative environment that encourages the continuous development of personal skills and knowledge.

Work Experience



AI Researcher & Solution Developer

Bosch | **Braga, PT - 2023 - Present (1 year & 10 months)**

- Connected manufacturing project (Sensors, 5G and AI).
- Understand the whole system and provide the appropriate AI algos in the field of Audio processing, MLOps, efficient Pipeline creation for AI continuous learning and deployment
- Support the SW team and develop software for process optimization/monitoring;
- Responsible for a Strategic project that aims to improve and continuously monitor production processes, using AI;
- Design and implement systems using AI/ML frameworks to meet client requirements and ensure high product quality. Responsibilities include tasks in computer vision, NLP, and multimodal applications, such as OCR and QA.

Keywords: *MLOps, Anomaly Detection, Classification, Signal Processing, Tensorflow, Keras, HuggingFace*



Researcher

Section of Cognition, Data and Education | **BMS faculty UT | Enschede, NL - 2021-2023 (2 years & 2 months)**

- Domain translation of Clinical Neurophysiological research questions/needs into Data Science and ML/DL fields. This mediating capacity allowed successful collaboration of CoDE and CNPH groups, boosting the development of project and clinical validation.
- Publication of the developed unsupervised and semi-supervised deep learning pipelines for detection of EEG anomalies.
- Implementation and optimization of robust algorithm with a sensitivity of **81.9%** and a specificity of **91.7%**

Keywords: *EEG, Anomaly Detection, Autoencoder, VAE, VAE-GANs, Diffusion Models, Gen AI, Signal Processing, Tensorflow*

Assistant Researcher (Master's Thesis)

Clinical Neurophysiology Group (CNPH) | **TechMed Center UT | Enschede, NL**

- Review of state-of-the-art approach for captioning in image/signal/video and Inspired on that development, troubleshooting and comparison of **6** pipelines for EEG captioning.
- Presentation and defense of the thesis before a prestigious jury composed of AI and neurologist experts, having obtained the grade of **19/20**, result of **excellence** (among **10%** of higher grades).
- **Awarded** for the performance in the master's thesis "*Learning to write medical reports from EEG data.*" with a job position as Researcher.

Keywords: *Attention models, Captioning, Classification, Video, Image, Time-series, Encoder-Decoder, NLP, Numpy, SciPy*

Junior Researcher (Erasmus+ Internship)

Clinical Neurophysiology Group (CNPH) | **TechMed Center UT | Enschede, NL**

- Research and implementation of various data augmentation approaches, from traditional signal transformation to more complex data approach, generative models like GANs.
- Proposing the use of different forecasting models for data augmentation.
- Provided important insight into EEG properties and behavior/potential of different approaches, stimulated further research and emergence of new projects.
- Invited to develop a master's thesis at the institution, after obtaining the **Excellent** grade, **19/20** in this Erasmus+ internship, "*GANs and Data Augmentation Prediction Models in the Detection of Interictal Epileptiform Discharges (IEDs)*".

Keywords: *Time-series, Biosignal, GANs, CNN, LSTM / GRU and hybrid models.*



Summer Internship

Visual Computing & Machine Intelligence Group | INESC Technology and Science | Porto, PT - 2020-2021 (6 months)

- Impact of facial dynamic fusion information & DBN in Drowsiness detector performance (AUTOMOTIVE proj).
- Collaboration with other master and PhDs students for the development of robust Drowsiness detector system to detect driver fatigue.

Keywords: Computer Vision, Facial dynamic fusion, DBN, OpenCV, Scikit-learn

Researcher Intern

Biomedical Imaging Lab from C-BER | INESC Technology and Science | Porto, PT

- Characterize lesions associated with lung cancer, using an annotated computed tomography dataset.

Keywords: CT scans, Neural networks, Computer Vision, Image Segmentation

Publications

- Detection of Interictal epileptiform discharges with semi-supervised deep learning.
Biomedical Signal Processing and Control, Volume 88, Part B, 2024
- Learning to write medical reports from EEG data.
Masters dissertation. Faculty of Engineering of the University of Porto, 2022

Education



ERASMUS+ Internship

Institution: Faculty of Science and Technology, University of Twente

February 2022 to August 2022

February 2021 to July 2021

Final Grade: 19 / 20 (A)

Final Grade: 19 / 20 (A)



Bachelor & Master in Bioengineering - Biomedical Engineering

Institution: Faculty of Engineering, University of Porto

2017 - 2022

Final Grade: 18 / 20 (A)

Awards



3rd Place - World Data League 2023

Member of the team 'CEOS'. We finished the international competition in 3rd place among 29 teams of best minds in Data Science.

Personal Projects & Independent Learning

This section highlights my primary interests in AI, where I have consistently advanced my knowledge and skills through self-study, Courses/ certifications. For more details, please visit my github repositories: [AMfeta99](#)

- **Generative AI (Gen AI)**
- **2D/3D Computer Vision**
- **Natural language Processing & Large Language models**



Relevant projects:

- TimeMetamorph: Object Evolution Generator system powered by AI agents (ReAct, HuggingFace, Gradio)
- BankWise.AI: Smart voice-powered assistant delivering human-like support via specialized AI agents (Langgraph, OpenAI-api, Tavily, Whisper)
- LM-vs.-Human-Minds: This game challenges humans to compete against LLM models in a variety of games. (LLM, LangChain, Ollama-api)
- Seizure Prediction in Intracranial EEG Recordings (Python, PyTorch, Scikit-Learn)
- ValueExtractionOCR: Automates receipt scanning with OCR to smartly extract/handle and return the total amount (Scikit-Learn, Google Vision)
- Brain Tumor Diagnosis App developed with Gradio. ViT fine-tuned for binary classification of brain scans (Transformer, HuggingFace, Gradio).

Tech Skills

- **Most Used:** Python, Pandas, Numpy, Scipy, Scikit- Sklearn, Tensorflow, Keras
- **Frequently/Occasionally used:** HuggingFace, Transformer, Ollama, Langchain, Langgraph, HTML, CSS, SQL, XGBoost, Matlab, LightGBM, Pytorch, Flask, Gradio, OpenAI-api, Smolagents
- **Basic Knowledge:** C, C++, JavaScript, PHP, Arduino, Docker, Multisim

Soft Skills

- Adaptability, Creativity, Self-Drive
- Problem solver, Proactive, Resilience
- Empathy, Teamwork, Communication

Languages

- Portuguese (native)
- English (advanced)
- Spanish (beginner)
- Dutch (beginner)