Federico Ferreyra

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Machine Learning & AI Developer - Sound Engineering

+4 years of experience in **Audio Engineering**, coupled with **2 years** working as a **Machine Learning Engineer**. My expertise extends to multiple projects executed using prominent tools such as **Python**, **Scikit-Learn**, **Keras**, **TensorFlow**, **PyTorch** and **Docker**. With **+3 years** of hands-on experience in Python applications for Digital Signal Processing (**DSP**) and Digital Audio, I bring a deep understanding of these domains to my work. Currently engaged as an **AI Developer** at Telecom Argentina, where I am spearheading development, training, and deployment activities using **AWS** services. My role involves harnessing my technical skills and knowledge to orchestrate the seamless integration of **AI solutions** oriented to **Computer Vision** and audio.

Work Experience

AI Developer at Telecom Argentina

May 2023 to date

- Sound Event Detection & Audio Classification for in-company clients. Developed a baseline using ResNet50 and progressed to state-of-the-art (SOTA) Transformer models like HTS-AT and BEATs.
- Orchestrated deployment AWS services including EC2, Sagemaker, ECR, ECS, Lambda and S3.
- Implemented fine-tuning, built a custom trainer and designed a DSP pipeline to achieve an end-to-end solution.

Tech stack: Python, Bash, JupyterLab, Scikit-Learn, TensorFlow, Keras, PyTorch, Docker, Redis, Git, OpenCV, Postman, Transformers, Computer Vision, Hugging Face & AWS (EC2, Sagemaker, S3, ECR, ECS, Lambda, S3)

Data Science Tutor at Coderhouse

Feb 2023 to Aug 2023

- Addressed students' inquiries, providing clear responses to enhance their understanding of course material.
- Reviewed and assessed deliverables, ensuring alignment with course objectives.
- Maintained consistent follow-up with students, offering ongoing guidance and support.
- Motivated students fostering a proactive learning attitude and helped overcome difficulties.

Machine Learning Engineer at Anyone AI

Apr 2022 to Dec 2022

- Object detection for in-store inventory management - Developed a scalable microservices architecture using Docker (docker-compose) to implement Flask, Redis, and a fine-tuned YOLOv5 model. Deployed the model on AWS EC2 with a custom dataset host on S3.
- Products review classification - Developed a sentiment analysis model to detect positive and negative opinions for movie reviews using BoW, TF-IDF, and word embedding.
- Image Classification for E-Commerce - Trained a fine-grained classification model using CNNs on a pre-built dataset of 196 classes, achieving 82% accuracy. Deployed the model in AWS EC2 using Docker container.
- Home Credit Risk Analysis - Trained multiple supervised models using DecisionTree, XGBoost, and LightGBM, achieving +0.72 ROC AUC.
- Salary Prediction Model - Developed a linear regression model to predict salary levels based on historical data for sports players using Python and Pandas, achieving an F1 score of 76%.

Tech stack: Python, Numpy, SciPy, Pandas, Matplotlib, Seaborn, Scikit-Learn, TensorFlow, Keras, PyTorch, Docker, Flask, Redis, AWS (EC2 & S3), Bash, Git, OpenCV, Postman

Projects

- **Speaker diarization with Siamese Neural Networks (SNN)** 2022
  Simple implementation using TensorFlow and Keras to build a twin architecture and calculate dissimilarities between speakers as final project of a Seminar (Neural networks applied to Musical Information Retrieval).

Tech stack: Python, Numpy, SciPy, Librosa, TensorFlow, Keras

- **Adaptive filter for signal prediction with noise** 2019
  Python implementation of an adaptive Kalman filter, aiming at predicting the sound pressure level SPL (dBSPL) at a certain distance from the source and in which the measurement may be subject to high noise levels.

Tech stack: Python, Numpy, Digital Signal Processing (DSP)

- **Impulse Response measurement software** 2018
  MATLAB development to apply convolutional operations using sine sweeps to obtain the Impulse Response of an enclosure and extract acoustic parameters. Obtaining EDT, T20, T30, C50.

Tech stack: MATLAB, REW, Reaper/Audacity

Languages

Fluent in **English** (B2+) - **Spanish** native - **French** native

Education

National University of Tres de Febrero (Buenos Aires) 2012 to 2023
Sound Engineering

Certifications

Anyone AI 2022
Machine Learning Engineer

UNTreF 2022
Neural networks applied to Musical Information Retrieval (MIR)