Federico Ferreyra

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Machine Learning & AI Engineer | Audio & Computer Vision

As an **AI Engineer** at Telecom Argentina, I leverage my extensive experience in **Machine Learning** and **Audio Engineering** to drive innovation in **AI** initiatives. Over the past 2 years, I've successfully integrated state-of-the-art models into business-oriented **AI solutions**, achieving seamless integrations with **AWS**. My expertise spans across **Scikit-Learn**, **Keras**, **TensorFlow**, and **PyTorch**, which I've used to develop, train, and deploy all kind of **ML applications** and **features**. My strong **Python** foundation, honed through a proven track record of delivering high-quality **Digital Audio** and **DSP** solutions, is now my primary tool.

Work Experience

AI Engineer at Telecom Argentina — May 2023 to date

- Developed an AI subtitle generator using AWS Transcribe in a Python client for live streaming processing in a low latency live broadcast pipeline via AWS Elemental MediaLive & MediaPackage.
- Implemented Sound Event Detection & Audio Classification, starting with a baseline model using ResNet50 and advancing to state-of-the-art (SOTA) Transformer models like HTS-AT and BEATs.
- Managed deployments on AWS IaC (CloudFormation) using EC2 and Sagemaker endpoints, as well as Serverless solutions like Lambda and ECS with Fargate for scaling.
- Designed and built a custom trainer and fine-tuning pipeline with DSP pre-processing module, providing an end-to-end solution on Cloud infrastructure.

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.

Machine Learning Engineer at Anyone AI — Apr 2022 to Dec 2022

- Object detection for in-store inventory management - Developed and deployed a scalable microservices architecture using Flask, Redis, and a fine-tuned YOLOv5 into Docker (docker-compose) containers.
- 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 CNN on a pre-built dataset of 196 classes, achieving 82% accuracy. Deployed EC2 instance using Docker container.
- Home Credit Risk Analysis - Trained multiple supervised models using DecisionTree, XGBoost, and LightGBM, achieving a significant ROC AUC score of +0.72.
- Salary Prediction Model - Developed a linear regression model using Python and Pandas to predict salary levels based on historical data for sports players, achieving an F1 score of 76%.

Tech stack: Python, Bash, Jupyter, JupyterLab, VS Code, Numpy, SciPy, Pandas, Matplotlib, Scikit-Learn, TensorFlow, Keras, PyTorch, OpenCV, Docker, Flask, Streamlit, Redis, Git, Postman, GitHub Actions, ffmpeg, HLS, DASH
Cloud stack: AWS, EC2, S3, Lambda, Sagemaker, ECR, ECS, SQS, CloudWatch, IAM, CloudFormation

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)