NAHUEL PASSANO

Sr. Audio AI Engineer | Acoustical Engineer

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📍 Argentina   in Nahuel Passano

SUMMARY

I am a high-performing, intrinsically motivated individual with a strong passion for technology. I thrive in multi-disciplinary, multicultural teams, and am driven by challenges that significantly impact users.

SKILLS

Python: PyTorch, TensorFlow, MLFlow, Pandas, Seaborn, Plotly, FastAPI, Poetry.

Technologies: AWS, Docker, Kubernetes, GitHub Actions.

EXPERIENCE

3/2024 – Present   **Sr Audio AI Engineer**   **Fusemachines**

- R&D of speech denoising and dereverberation algorithms in real-time.
- Research into state-of-the-art literature on speech enhancement techniques.
- Development of datasets for speech separation, enhancement, and dereverberation.
- Design and deployment of web applications with Streamlit for model implementation.

Tech Stack: `ONNX / PyTorch 2.x / Streamlit / Weights & Biases`

9/2023 – 3/2024   **Ssr Machine Learning Engineer**   **EverythingALS**

- Presentation of scientific advancements to high-level executives, emphasizing skills in communication and specialized information management.
- Development of signal processing pipelines for the extraction of digital biomarkers from speech and measurements of pressure sensors, accelerometers and gyroscopes.
- Training of supervized models to predict subjective metrics of ALS patients.
- Design of a proof of concept on voice cloning for ALS patients using Eleven Labs, TortoiseTTS and RVC.

Tech Stack: `Scikit Learn / SciPy / FastAPI / Black / PyLint`

4/2023 – 10/2023   **Ssr Machine Learning Engineer**   **MecanTronic**

- Technical leadership in an Audio Machine Learning project (Voice Cloning for Argentinian speakers).
- Design technical exam for the selection process, perform technical interviews
- Machine Learning projects lifecycle managment with MLFlow.
- Implementation of CI pipelines with GitHub Actions for automated testing.
- Cloud architect with AWS for Machine Learning projects.
- Containerization of Machine Learning applications using Docker.

Tech Stack: `PyTorch / AWS / Docker / ML Flow / GitHub Actions / Poetry`

4/2022 – 4/2023   **Jr Machine Learning Engineer**   **MecanTronic**

- EDA for Object Detection and Instance Segmentation datasets.
- Reserch and application of Computer Vision models for object detection in drone imagery.
- Adaptation of libraries such as Detectron2 and Anomalib for instance segmentation and anomaly detection tasks in drone imagery.
- Full pipeline development of preprocessing, inference and postprocessing in Computer Vision projects.
- Training AI models on GPU cloud instances (AWS EC2, Paperspace).

Tech Stack: `TensorFlow / OpenCV / Pillow / Plotly / Seaborn`

2/2022 – 7/2022   **R&D Internship**   **Infiniem Labs**

- R&D on Automatic Speech Recognition (ASR) systems with Wav2Vec 2 and Whisper.
- Development of a voice assistant integrated with Telegram Bots for lab use.

Tech Stack: `HuggingFace / Telegram Bots`

EDUCATION

8/2016 - 12/2023   **Acoustical Engineering**   **National University of Tres de Febrero**

Bachelor's Degree in Engineering with a focus on advanced concepts in acoustic measurements for room control and sensing, electroacoustics for speaker design, audio electronics for the development of specialized equipment, and digital signal processing (DSP) for the development of specific audio and acoustics software.

TEACHING EXPERIENCE

9/2023 – Present   **Professor: Data Science**   **Humai Institute**

- Tutor and technical advisor for neuroscience data science projects at BrainHack 2024.
- Coordination of certification projects in Applied Data Science, providing technical and methodological guidance to students for the completion of their projects.
- Teaching classes in Mathematics, Computer Vision, and Machine Learning.
- Technical support for institute students.

3/2022 – Present   **Assistant professor: Digital Signal Processing**   **National University of Tres de Febrero**

- Subject content: DTFT, DFT, FFT, STFT, Z-transform, IIR and FIR filters, DDSP
- Python lessons oriented to DSP. Assigment review.
- Weekly quiz development.
- Creation of didactic applications for the students.

3/2018 – 03/2022   **Assistant professor: Multivariable Calculus**   **National University of Tres de Febrero**

- Subject content: Differentiation, Higher-Order derivates, Green's, Stokes's and Gauss's theorems.
- Assigment review.
- Theorical and practical notes writing for students

CERTIFICATES

Sequence Models	DeepLearning.ai	**MLOps concepts**	DataCamp
Convolutional Neural Networks	DeepLearning.ai	**Cloud Computing (AWS)**	CoderHouse
Data Analysis with Python	freeCodeCamp	**Docker for the absolute beginner**	KodeKloud

PUBLICATIONS

2023   **Rioplatense Voice Cloning System for Communication Rehabilitation**   **Argentinian Congress of Acoustics**
Development of a open-access voice cloning platform specialised in the Rioplatense dialect of Spanish. The research compares two SOTA models (Tacotron2 and FastPitch) evaluating their performance from both subjective (MOS) and objective (PESQ, STOI, SISDR) perspectives.

PROJECTS

DSP - Acoustics   **AIRA: Ambisonics Impulse Response Analyzer**   **GitHub Repository**
Innovative software for visualizing impulse responses from Ambisonics microphones, featuring an interactive interface that allows for detailed examination of sound reflections using 'hedgehog-type' graphs

Speech processing   **Mi Identidad Vocal**   **Interview**
Development of voice cloning software for the former national deputy Jorge Rivas. Through his sessions in the Chamber of Deputies, his voice was successfully reconstructed, restoring his vocal identity.

LANGUAGES

English - B2+, **Spanish** - Native

OTHER SKILLS AND HOBBIES

Multi-instrumentalist (bass, guitar, keyboard) - **Critical audio listening** - **Trekking lover**