LEONARDO PEPINO

PERSONAL INFORMATION

Address: General Rodriguez (1748), Argentina
E-mail: leonardodpepino@gmail.com
Age: 30
Personal website: https://mrpep.github.io/myblog/

EDUCATION

Universidad de Buenos Aires (UBA)   *4/2020 - 4/2025*
PhD. in Computer Science

My project is titled "New deep learning strategies for general sound understanding" and is supervised by Dr. Luciana Ferrer and co-supervised by Dr. Pablo Riera. The main idea of the project is to design a reusable deep learning model for general audio tasks, which can be used for transfer learning in low-resource scenarios. I am adapting transformer models to deal with audio signals, and exploring different pretext tasks to pretrain this kind of models.

Universidad Nacional de Tres de Febrero (UNTREF)   *8/2013 - 3/2019*
Dipl. Sound Engineering

My thesis work is titled "Music source separation using convolutional neural networks" and was supervised by Dr. Laurence Bender. My GPA is 8.07. Check out my thesis website.

SKILLS

Python   *+7 years*

Experience using main machine learning libraries: Pytorch, Tensorflow, Jax and Scikit-Learn; Audio signal processing libraries: Librosa, open-smile, soundfile; Data processing and visualization: Pandas, numpy, matplotlib; Concurrent and distributed processing: Ray and multiprocessing.

C++   *+5 years*

Intermediate. Use of C++ standard library and data structures, OOP, dynamic and static libraries.

Matlab   Basic

R   Basic

Linux OS   Intermediate

Latex   Intermediate

English   First Certificate in English

EXPERIENCE

Applied Artificial Intelligence Laboratory (LIAA)   *2019 - Present*

I am a member of the Speech Processing Group of the LIAA where my PhD work takes place.

I participated in the research project "Automatic Detection of Degree of Trust from Speech" directed by Dr. Luciana Ferrer and Dr. Agustín Gravano, and supported by AFOSR.

Research Intern at Google 2024

I successfully completed an internship at Google (New York) in the speech research team under the mentorship of Andrew Rosenberg, working on novel ideas related to variable-rate representation learning. This was a great opportunity to learn more about neural audio codecs, speech LLMs and gradient propagation through non-differentiable layers.

Internship at ASAPP 2024

I did a 3 months remote internship in the speech research group at ASAPP. My mentor was Suwon Shon and I worked in integrating speech reasoning capabilities inside Large Language Models (LLMs). This was an excellent opportunity to learn more about LLMs, LORA fine-tuning and multimodal LLMs.

Internship at BUT Speech 2023

I did a 3 months internship at the Brno University of Technology Speech Group in Czech Republic. My mentor was Martin Karafiat and I worked in multichannel ASR for the CHiME-7 challenge, finetuning speech foundation models and introducing adaptations for target speaker ASR.

Student Researcher at Google LLC 2022

I did a 3 months internship in the Google Sound Understanding Group in Mountain View, CA. My mentor was Aren Jansen and I worked in topics related to textless NLP, acoustic language models, self-supervised learning and long-range memory.

Master in data mining and knowledge discovery - UBA *2020 - 2022*

Auxiliary teacher in the course 'Machine Learning'. I was in charge of the practical classes and collaborated in the design and evaluation of practical work and exams.

Internship at HIPCAM Global *2020 - 2021*

I collaborated with the design and development of wake-word detection models using deep learning, and participated in the development of a complete machine learning pipeline, from data preprocessing to model deployment in intelligent surveillance systems.

Universidad Nacional de Tres de Febrero *2018 - 2020*

I collaborated in the research project "Analysis and validation of mathematical models for their implementation in an airborne and impact sound insulation software" directed by Joaquín Mansilla Benasco.

GRANTS AND AWARDS

Participated of the first **CI Hackathon** winning the 1st place (2021).

Received the **Ing. Isidoro Marín award**, given to outstanding recently graduated young engineers (2020)

Together with Luciana Ferrer, We received the **Google Faculty Research Award 2019-2020** in the Machine Perception field and the **Amazon Research Award 2019** for my doctoral thesis project.

I received the **Internal doctoral scholarship for strategic topics CONICET 2019**.

PUBLICATIONS

Pablo Alonso-Jiménez, **Leonardo Pepino**, Roser Batlle-Roca, Pablo Zinemanas, Dmitry Bogdanov, Xavier Serra, Martín Rocamora. Leveraging Pre-Trained Autoencoders for Interpretable Prototype Learning of Music Audio. ICASSP 2024 Workshop on Explainable AI for Speech and Audio.

Leonardo Pepino, Pablo Riera, Luciana Ferrer. EnCodecMAE: Leveraging neural codecs for universal audio representation learning. Submitted to ICASSP 2024.

Pablo Riera, Manuela Cerdeiro, **Leonardo Pepino**, Luciana Ferrer. Phone and speaker spatial organization in self-supervised speech representations. ICASSP 2023.

Ricardo Barchi, **Leonardo Pepino**, Lara Gauder, Lautaro Estienne, Martin Meza, Pablo Riera, Luciana Ferrer. Apparent personality prediction from speech using expert features and wav2vec 2.0. Interspeech 2023.

Leonardo Pepino, Pablo Riera, Germán Barchi, Joaquín Giaccio. A latinamerican multi-accent TTS with voice cloning capabilities. ICASSP 2022 Show and Tell.

Leonardo Pepino, Pablo Riera, Luciana Ferrer. Study of positional encoding approaches for Audio Spectrogram Transformers. ICASSP 2022.

Leonardo Pepino, Pablo Riera, Luciana Ferrer. Emotion Recognition from Speech Using Wav2vec 2.0 Embeddings. Interspeech 2021.

Lara Gauder, **Leonardo Pepino**, Luciana Ferrer and Pablo Riera. Alzheimer Disease Recognition Using Speech-Based Embeddings From Pre-Trained Models. Interspeech 2021.

Luciano De Bortoli, **Leonardo Pepino**, Luciana Ferrer, Edgar Altszyler, Pablo Riera. Detección de comandos de voz en dispositivos móviles (Keyword spotting in mobile devices). In Simposio Argentino de Ciencia de Datos y GRANdes DAtos 2020.

Leonardo Pepino, Pablo Riera, Lara Gauder, Agustín Gravano, Luciana Ferrer, "Detecting Distrust Towards the Skills of a Virtual Assistant Using Speech" arXiv:2007.15711

Lara Gauder, Pablo Riera, **Leonardo Pepino**, Silvina Brussino, Jazmín Vidal, Luciana Ferrer, Agustín Gravano "Trust-UBA: A Corpus for the Study of the Manifestation of Trust in Speech" arXiv:2006.05977

Leonardo Pepino, Pablo Riera, Luciana Ferrer, Agustín Gravano, "Fusion approaches for emotion recognition from speech using acoustic and text-based features". ICASSP 2020

Joaquín Mansilla, Laurence Bender, **Leonardo Pepino**, "Modelo de predicción de aislamiento acústico para paneles simples y multicapa", en Revista Elektron, Vol. 3, No.1, pp. 16-23. 04/2019.

Leonardo Pepino, Laurence Bender, "Separación de fuentes musicales mediante múltiples decodificadores paralelos", en IV Jornadas de Acústica, Audio y Sonido (JAAS). Caseros, Argentina. 08/2018.

Joaquín Mansilla, Florent Masson, Ignacio Calderón de Palma, **Leonardo Pepino**, "Sound insulation of homogeneous single panels: A comparison between real construction materials and several prediction models", en Proceedings of The 24th International Congress on Sound and Vibration (ICSV24). 08/2017

ADDITIONAL ACTIVITIES

I have supervised the following undergraduate theses, which were successfully defended:

- Alejandro Sosa Welford. "Development of a dataset for automatic evaluation of text to speech systems". Role: **Advisor**

- Cecilia Bolaños. "Similarity analysis of word representations from audio and text models". Role: **Advisor**

- Germán Barchi. "Cochlear implant strategies optimization using computer auditory models". Role: **Advisor**

- Martín Meza. "Speech dereverberation using deep learning". Role: **Advisor**

- Alejandro Suarez. "Chromagrams extraction for automatic chord recognition using neural networks". Role: **Advisor**

- Luciano de Bortoli. "Acoustic scene recognition using neural networks in a mobile device". Role: **Co-advisor** (Advisor: Laurence Bender).

I've also been judge of several undergraduate theses and been reviewer for international conferences and journals. I have given talks in several scientific dissemination events:

- Invited lecture in the ISCA group Security and Privacy in Speech Communication (SPSC) webinar. "A Study on the Manifestation of Trust in Speech" Link (2021/2)

- Oral presentations in international conferences (ICASSP 2020, Interspeech 2021, ICASSP 2022, ICASSP 2023)

In my free time, I enjoy listening to music and playing guitar. I also like travelling and hiking.