

Bernardo Torres

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🌐 <https://bernardo-torres.github.io> | 🐾 github.com/bernardo-torres | 💬 [linkedin](#) | 📖 [Google Scholar](#)

Researcher in machine learning for audio and music, interested in the intersection between signal processing, deep learning, unsupervised and self-supervised learning for music information retrieval, audio source separation and generative modeling.

Education

Telecom Paris, Institut Polytechnique de Paris

Ph.D. Student in Machine Learning and Signal Processing for Audio and Music

Paris, France

2023 - May. 2026 (expected)

- Data-driven analysis-by-synthesis for music source separation and transformation.
- Advisors: Prof. Geoffroy Peeters, Prof. Gaël Richard

École Normale Supérieure Paris-Saclay

M.S. in Computer Science and Applied Mathematics, MVA. **Highest honors**.

Gif-sur-Yvette, France

2021-2022

- MVA stands for Mathematics, Vision and Learning (Apprentissage). Top AI Research Master in France.
- Deep Learning, Artificial Intelligence, Time Series, Audio and Speech processing, Computer Vision

Telecom Paris, Institut Polytechnique de Paris

B.S. in Computer Science / Engineering Diploma, **GPA: 4.0/4.0**.

Paris, France

2020-2022

- Machine Learning, Signal Processing and Embedded Systems majors.

Federal University of Minas Gerais

B.S. in Electrical Engineering

Belo Horizonte, Brazil

2016-2022

- Electrical, Electronics and Computer Engineering

Work Experience

Deezer

Research Scientist Intern

Paris, France

Apr. 2025- Jul. 2025

- Investigated diffusion and consistency models for audio compression.
- Advisor: Gabriel Meseguer-Brocal

Sony Computer Science Laboratories

Research Scientist Intern

Paris, France

Apr. 2022-Sep. 2022

- Developed a self-supervised foundation model for singing voice (published at ISMIR 2023).
- Advisor: Stefan Lattner

Radix Engineering and Software

Data Science Intern

Belo Horizonte, Brazil

Jul. 2019 - May 2020

- Developed and deployed LSTM networks for time series analysis and anomaly detection.

Publications

Journal Publications

- **Torres, B.**, Peeters, G. and Richard, G., The Inverse Drum Machine: Source Separation Through Joint Transcription and Analysis-by-Synthesis, *TASLP*, 2025.
- Riou, A., **Torres, B.**, Hayes, B., Lattner, S., Hadjeres, G., Richard, G., and Peeters, G., PESTO: Real-Time Pitch Estimation with Self-supervised Transposition-equivariant Objective, *TISMIR*, 2025.

Conference Publications

- *Under review:* **Torres, B.**, Moussallam, M. and Meseguer-Brocal, G., Learning Linearity in Audio Consistency Autoencoders via Implicit Regularization, 2025.
- **Torres, B.**, Peeters, G. and Richard, G., Unsupervised Harmonic Parameter Estimation Using Differentiable DSP and Spectral Optimal Transport. *ICASSP 2024*.
- Richard, G., Chouteau, P. and **Torres, B.**, A Fully Differentiable Model for Unsupervised Singing Voice Separation. *ICASSP 2024*.
- **Torres, B.**, Lattner, S. and Richard, G., Singer Identity Representation Learning using Self-Supervised Techniques. *ISMIR 2023*.

Teaching Experience

Telecom Paris, Institut Polytechnique de Paris

Teaching Assistant

Paris, France
2023–Present

Deep Learning I, from IP Paris' Data Science M.S. program

TSIA 201 Signal Processing

TSIA 206 Speech and Audio Processing

TSIA 203 Introduction to Deep Learning

Awards and Scholarships

BRAFITEC excellence double degree scholarship

Two-year scholarship granted by CAPES foundation

2020-2022

Skills

Deep Learning: PyTorch, TensorFlow

Programming Languages: Python, C, C++

Other: Docker, Git, Slurm, Hydra

Spoken Languages: Portuguese (native), English (fluent, C2), French (fluent), Spanish (B2)

Interests: Music, Sound synthesis, Electronic Music Production/Mixing, Meditation, Philosophy, Cognitive Science