

# Bernardo TORRES

Researcher in machine learning applied to audio and signal processing

@ bernardo.torres@telecom-paris.fr  
bernardo-torres.github.io  
bernardo-ferreira-torres  
bernardo-torres

## EDUCATION

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- 2023-Present **Ph.D. Student in Computer Science / Artificial Intelligence for Audio and Music**, *Telecom Paris, Institut Polytechnique de Paris, Palaiseau, France*  
Audio and music analysis, source separation and synthesis using hybrid deep learning  
Part of HI-Audio project (Hybrid and Interpretable Deep Neural Audio Machines)
- 2021-2022 **M.S. in Computer Science**, *ENS Paris-Saclay, Gif-sur-Yvette, France*  
Mathematics, Vision and Learning (MVA) master's program. Highest honors.  
Deep Learning, Artificial Intelligence, Audio and Speech processing, Computer Vision
- 2020-2022 **B. S. in Computer Science**, *Telecom Paris, Institut Polytechnique de Paris, Palaiseau, France*  
Signal Processing, Machine Learning, Embedded Systems. GPA: 4.0/4.0
- 2016-2022 **B. S. in Electrical Engineering**, *Universidade Federal de Minas Gerais, Belo Horizonte, Brazil*  
Electrical, Electronics and Computer Engineering

## WORK EXPERIENCE

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- Apr. 2022-  
Sep. 2022 **Research Intern**, *Sony Computer Science Laboratories, Paris, France*  
Research topic: Singing Voice Conversion in a music production context  
Research in Deep Generative models, Neural Audio Synthesis, Self-Supervised Learning
- Jul. 2019 -  
May 2020 **Data Science Intern**, *Radix Engineering and Software, Belo Horizonte, Brazil*  
Worked with data science and machine learning with a focus in predictive maintenance and anomaly detection  
Trained and deployed models based on statistical quality control and LSTM networks

## PUBLICATIONS

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- **Torres, B.**, Lattner, S. and Richard, G., 2023. Singer Identity Representation Learning using Self-Supervised Techniques. *In International Society for Music Information Retrieval Conference (ISMIR 2023)*.
- Richard, G., Chouteau, P. and **Torres, B.**, 2024. A Fully Differentiable Model for Unsupervised Singing Voice Separation. *In IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2024)*.
- **Torres, B.**, Peeters, G. and Richard, G., 2024. Unsupervised Harmonic Parameter Estimation Using Differentiable DSP and Spectral Optimal Transport. *In IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2024)*.

## TEACHING EXPERIENCE

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- 2023-Present **Teaching assistant**, *Telecom Paris, Institut Polytechnique de Paris, Palaiseau, France*  
Help in lab assignments for the following courses: *Deep Learning I*, from IP Paris' Data Science M. S. program; *TSIA 201 Signal Processing*; *TSIA 206 Speech and audio processing*.

## AWARDS AND SCHOLARSHIPS

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- 2020 **BRAFITEC excellence double degree scholarship**, *Granted by CAPES foundation*, Awarded a two-year scholarship

## PROJECTS

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- 2018-2019 **Head of electronics**, *Formula SAE UFMG - Formula Student Team from Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, Brazil*  
Lead a group of 8 people in the design, manufacturing and testing of the electrical and electronics subsystems  
Designed, developed and deployed an embedded data acquisition system

2017-2019 **Team member - Telemetry and Data**, *Formula SAE UFMG, Belo Horizonte, Brazil*  
Designed the team's first telemetry system, from embedded board design to user interface development

## SKILLS

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

**Programming Languages:** Python, C, C++, SQL, SystemVerilog

**Software, Platforms:** Git, Linux, LaTeX, Matlab, Microsoft Azure, Solidworks, Pi System, LabView

**Other/Interests** Music, Sound synthesis, Electronic Music Production/Mixing, Meditation, Philosophy