

## EXPERIENCE

**Summary:** Applied Scientist with more than 10 years of experience developing innovative audio and acoustic solutions. Expertise in signal processing, numerical optimization, and open-source software. Passionate about contributing to the future of technology through cutting-edge research and development.

### **EssilorLuxottica**

Sr. Principal Investigator

Milan, IT

May 2024 –Present

### **Amazon**

Applied Scientist in the Alexa wakeword metrics & data team

Boston, USA

January 2022 –April 2024

- Design algorithms for audio quality estimation of generative models (text-to-speech, music generation)
- Generation and optimization of evaluation audio datasets using statistics, text-to-speech and novel data augmentation algorithms
- Define and research novel metrics for measuring performance of Alexa wakeword models using A/B test, weekly business reviews and device/model launch decisions
- Time series modeling and analysis for outlier detection to prevent customer experience degradation
- Develop and maintain large codebase and complex privacy-preserving data pipelines

### **Idiap Research Institute**

Postdoc Researcher in the Speech & Audio Processing Group

Martigny, CH

April 2019 –April 2021

- Research on out-of-distribution in neural networks which resulted in a publication in the IEEE Signal Processing letters
- Worked on a customizable keyword spotting which resulted in a patent application in collaboration with Logitech (SHAPED)
- Research on automatic speech recognition (ASR) acoustic model training exploiting sparsity (SHISSM)
- Build an open-source ASR model training framework

### **KU Leuven**

Postdoc Researcher at STADIUS (Center for Dynamical Systems, Signal Processing, and Data Analytics)

Leuven, BE

September 2018 –April 2019

- Research on dereverberation & speech enhancement algorithms under the European Union's Horizon 2020 research and innovation program / ERC Consolidator Grant: SONORA

### **KU Leuven**

PhD Researcher at STADIUS (Center for Dynamical Systems, Signal Processing, and Data Analytics)

Leuven, BE

May 2013 –August 2018

- Develop novel algorithms for solving inverse problems for dereverberation and room identification using numerical acoustics models and compressed sensing (DREAMS Marie Skłodowska-Curie fellowship)
- Published 3 Journal papers and 5 conference papers as first author
- Released 5 open-source packages for numerical optimization and acoustic simulations

### **Imperial College London**

Visiting Researcher at Speech and Audio Processing (SAP) group

London, UK

May –Sept. 2015

- “Royal Society Summer Science Exhibition 2015 - Sound Interactions” event organization

### **Technical University of Denmark (DTU)**

Research Assistant at DTU Acoustic Technology

Lyngby, DK

2012 –2013

- Research on compensation of flux modulation distortion in loudspeaker with patent application

## TECHNICAL SKILLS

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- **Programming:** Python, SQL, Matlab, Julia, C/C++
- **Libraries:** PyTorch, pandas, TensorFlow, Keras
- **Tools:** AWS, spark, linux, git, L<sup>A</sup>T<sub>E</sub>X, vim
- **Laboratory:** Brüel & Kjær PULSE system analyzer, Klippel R&D System

## SOFT SKILLS

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- **Languages:** Italian (native), English (Proficient), French, Spanish (Conversational)
- **Teamwork:** project management & PhD supervision in fast-paced multi-disciplinary environment
- **Others:** O1-VISA award, creative & critical thinking, drawing, music theory

## EDUCATION

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### KU Leuven

PhD at STADIUS Center for Dynamical Systems, Signal Processing, and Data Analytics  
– Supervisors: Toon van Waterschoot, Marc Moonen

Leuven, BE  
2013 –2018

### Technical University of Denmark

M.Sc, Engineering Acoustics

Lyngby, DK  
2010 –2012

### Università degli Studi di Padova

B.Sc, Electrical Engineering

Padova, IT  
2007 –2010

## SOFTWARE

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Full list of projects: <https://nantonel.github.io/software/>

- **TIDIGITSRecipe.jl:** A Julia recipe for training an ASR system using the TIDIGITS database
- **HMMGradients.jl:** Gradient computation for Hidden Markov Models (HMMs) training
- **StructuredOptimization.jl:** Structured optimization for nonsmooth nonlinear problems
- **ImageMethodReverb.jl:** Room acoustics impulse responses generator using the randomized Image Method

## PUBLICATIONS

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Full list of publications on Google Scholar

1. **N. Antonello**, P. N. Garner, “A t-distribution based operator for enhancing out of distribution robustness of neural network classifiers,” *IEEE Signal Process. Letters*, 2020.
2. **N. Antonello**, E. De Sena, M. Moonen, P. A. Naylor, and T. van Waterschoot, “Joint acoustic localization and dereverberation through plane wave decomposition and sparse regularization,” *IEEE/ACM Trans. Audio, Speech Lang. Process.*, 2019.
3. **N. Antonello**, E. De Sena, M. Moonen, P. A. Naylor and T. van Waterschoot, “Room impulse response interpolation using a sparse spatio-temporal representation of a reverberant sound field”, *IEEE/ACM Trans. Audio, Speech Lang. Process.*, 2017.
4. E. De Sena, **N. Antonello**, M. Moonen, and T. van Waterschoot, “On the modeling of rectangular geometries in room acoustic simulations”, *IEEE/ACM Trans. Audio, Speech Lang. Process.* 2015.

## PATENTS

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1. A. Salarian, M. Cernak, P. Mainar, J. Chardon, **N. Antonello**, “Hybrid voice command processing,” US11763814B2, Dec. 2022.
2. F. T. Agerkvist, **N. Antonello**, and A. Christensen, “Loudspeaker assembly with suppression of magnetic flux modulation distortion,” WO Patent App. PCT/EP2014/073 655, May 2015.