

# NICCOLÒ ANTONELLO | Curriculum Vitae

- » **Status:** PhD at KU Leuven, Belgium
- » **Fields:** Acoustics, Audio Signal Processing, Numerical Optimization

## »»» Experience

May 2013-Present **PhD** KU Leuven (BE)

- » Supervisors: [Toon van Waterschoot](#), [Marc Moonen](#)
- » The PhD is part of the [DREAMS Initial Training Network \(ITN\)](#) FP7-PEOPLE Marie Curie ITN consortium. The research focuses on developing algorithms for solving inverse problems relating to *dereverberation* and *room identification* using *numerical room acoustics models* and *compressed sensing*.

May - Sept. 2015 **Visiting Researcher** Imperial College London (UK)

- » Supervisor: [Patrick A. Naylor](#)
- » Research collaboration with Prof. Patrick A. Naylor (still ongoing) and team member of the "[Royal Society Summer Science Exhibition 2015 - Sound Interactions](#)" event.

Oct. 2012 -Feb. 2013 **Research Assistant** Technical University of Denmark (DK)

- » Supervisor: [Finn T. Agerkvist](#)
- » Project: "Compensation of flux modulation distortion using an additional coil in a loudspeaker unit" which resulted in a [patent application](#).

## »»» Education

2013 - 2017 **PhD, KU Leuven** Various institutions

- » Relevant coursework: Numerical Optimization (Prof. M. Diehl, KU Leuven), DREAMS Machine Learning School at Imperial London College (Prof. S. Theodorides et al.), DREAMS Advanced Psychoacoustic School at Aalborg Univeristy (Prof. T. Lokki et al.), TEMPO Nonlinear Model Predictive Control School at University of Freiburg (Prof.J.B. Rawlings et al.),
- » Thesis title: "Dereverberation by inverse solution of the acoustic wave equation on a finite element grid".

2010 - 2012 **M.Sc, Engineering Acoustics** Technical University of Denmark (DK)

- » Relevant coursework: Advanced Acoustics, Acoustic Communication, Electroacoustic Transducers and Systems, Architectural Acoustics, Sound and Vibration, Partial Differential Equations
- » Thesis title: "Balanced Armature Transducers for Hi-fi Systems".

2007 - 2010 **B.Sc, Electrical Engineering** Università degli Studi di Padova (IT)

## »»» Publications

### Journal Papers

- » 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 Transactions of Audio, Speech Language Processing, vol. 25, no. 10, pp. 1929-1941, Oct. 2017.
- » E. De Sena, N. Antonello, M. Moonen, and T. van Waterschoot, "On the Modeling of Rectangular Geometries in Room Acoustic Simulations", IEEE Transactions of Audio, Speech Language Processing, vol. 23, no.6, pp. 774-768, Apr. 2015 Apr. 2015.

## Conference Papers

- » N. Antonello, E. De Sena, M. Moonen, P. Naylor, T. van Waterschoot, "Joint source localization and dereverberation by sound field interpolation using sparse regularizations," in in Proc. IEEE Int. Conf. on Acoust. Speech and Signal Process. (ICASSP-18), to appear.
- » N. Antonello, E. De Sena, M. Moonen, P. Naylor, T. van Waterschoot, "Sound field control in a reverberant room using the Finite Difference Time Domain method," in AES 60th Int. Conf., Leuven, Belgium, Feb. 2016.
- » N. Antonello, T. van Waterschoot, M. Moonen, and P. A. Naylor, "Evaluation of a Numerical Method for Identifying Surface Acoustic Impedances in a Reverberant Room," in Proc. 10th European Congress and Exposition on Noise Control Engineering (EURONOISE 2014), December 2014.
- » N. Antonello, F. T. Agerkvist, "Compensation of the Flux Modulation Distortion Using an Additional Coil in a Loudspeaker Unit", in AES 137th Int. Conv., Los Angeles, USA, Oct. 2014.
- » N. Antonello, T. van Waterschoot, M. Moonen, and P. A. Naylor, "Identification of Surface Acoustic Impedances in a Reverberant Room Using the FDTD Method," in International Workshop on Acoustic Signal Enhancement IWAENC 2014, Antibes, France, September 2014 (candidate for best student paper award).
- » N. Antonello, T. van Waterschoot, M. Moonen, and P. A. Naylor, "Source localization and signal reconstruction in a reverberant field using the FDTD method," in Proc. European Signal Process. Conf. (EUSIPCO '14), Lisbon, Portugal, Feb. 2014.

## Patents

- » 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.

## »» Skills

### Software

- » **Programming Languages:** *Proficient:* Julia, MATLAB,  $\LaTeX$ . *Familiar:* Python, C, Java.
- » **Others:** unix-shell, vim, Odeon, Adobe Flash, Maple, SketchUp, Comsol.

### Technical Skills

- » **Measurements:** experience with Brüel & Kjær PULSE system analyzer, Klippel R&D System and measuring room impulse responses/reverberation time.
- » **Others:** soldering simple analog circuits, oscilloscope usage, (non)technical drawing.

### Languages

- » *Proficient:* Italian (Native), English
- » *Elementary:* French

## »» Software Projects

- » **AbstractOperators.jl** Abstract operators for large scale optimization in Julia. <https://github.com/kul-forbes/AbstractOperators.jl>
- » **ProximalOperators.jl** Julia package to compute the proximal operator of several functions commonly used in optimization algorithms like ADMM and (fast) proximal gradient methods. <https://github.com/kul-forbes/ProximalOperators.jl>
- » **RIM.jl** Julia package for generating room acoustics impulse response using the Randomized Image Method (RIM). <https://github.com/nantonel/RIM.jl>
- » **AcFtdtd.jl** Julia package for 3D room acoustics simulations using Finite Difference Time Domain (FDTD) method. <https://github.com/nantonel/AcFtdtd.jl>

## »» Teaching

- » Teaching Assistant at Toon van Waterschoot's Signals and Systems Exercise sessions course 2017/18 (KU Leuven - Groep T)
- » Lecture: "Sparsity, Regularization and Convex Optimization" at Toon van Waterschoot's Advanced DSP topics 2 course (KU Leuven Geel) - 09/11/2016
- » Teaching Assistant at Marc Moonen's DSP-CSI Laboratory sessions course 2013-2017 (KU Leuven)
- » Teaching Assistant at Finn Jacobsen's Advance Acoustics Laboratory sessions course 2011-2012 (DTU)