

1995: Laurea Degree in Electronic Engineering at the University of Bologna. Subject of the Laurea dissertation: Noise Barrier Measurement by means of MLS methods. This project has been co-financed by the European Union (*ADRIENNE project, Measurement and Testing programme*). *The new European Noise Barrier measurement normative EN-1793 is mainly based on the work developed in this dissertation.*

1999: Ph.D at the University of Bologna, DIENCA.

2000-2004 : Postdoctoral researcher at the University of Bologna, DIENCA.

2006.. : Assistant Professor at the University of Bologna, DIENCA.

Main interests: Measurement of the acoustical properties of materials, digital signal processing, active noise control applied to HVAC, scientific software development, hardware and software design and building of measuring instruments.

Papers:

1 - M.Garai, M.Bérenghier, P.Guidorzi, Ph.L'Hermite. Procedure for measuring the sound absorption of road surfaces in situ, Proceedings of Euro-Noise '98 (**invited paper**), Munich, Germania, 4-7 Ottobre 1998.

2 - M.Garai, P.Guidorzi. Caratterizzazione in situ delle proprietà riflettenti di barriere acustiche non piate, Atti del 26' Convegno Nazionale AIA, Torino, 27-29 Maggio 1998.

3 - M.Garai, P.Guidorzi. Caratterizzazione in situ delle proprietà fonoisolanti di barriere acustiche, Atti del 27' Convegno Nazionale AIA, Genova, 26-28 Maggio 1999

4 - M.Garai, P.Guidorzi. Un prototipo di controllo attivo del rumore in condotti a sezione rettangolare, Atti del 27' Convegno Nazionale AIA, Genova, 26-28 Maggio 1999

5 - M.Garai, P.Guidorzi. European methodology for testing the airborne sound insulation characteristics of noise barriers *in situ*: experimental verification and comparison with laboratory data, *J. Acoust. Soc. Am*, 108 (3), Pt. 1, Sept 2000

6 - A.Cocchi, M.Garai, P.Guidorzi. Active noise control in heating, ventilation and air conditioning systems, Proceedings of 7th International Congress on Sound and Vibration, 4-7 July 2000, Garmisch-Partenkirchen, Germany.

7 - M.Garai, P.Guidorzi. Experimental verification of the european methodology for testing noise barriers *in situ*: Sound Reflection, Proceedings of InterNoise 2000 (**invited paper**), Nice, France, 26-30 August 2000.

8 - M.Garai, P.Guidorzi. Experimental verification of the european methodology for testing noise barriers *in situ*: Airborne Sound Insulation, Proceedings of InterNoise 2000 (**invited paper**), Nice, France, 26-30 August 2000.

9 - P.Guidorzi, V.Tarabusi. Controllo attivo del rumore in ambienti virtuali, Atti del 29' Convegno Nazionale AIA, Ferrara, 12-14 Giugno 2002.

- 10** - *P.Guidorzi, V.Tarabusi*. Affidabilita' e precisione delle misure acustiche effettuate utilizzando schede audio, Atti del 29' Convegno Nazionale AIA, Ferrara, 12-14 Giugno 2002.
- 11** - *G.Semprini, P.Guidorzi, M.Garai*. Experimental Evaluation of Noise Propagation through Rectangular Ducts in HVAC Systems. Proceedings of Euro-Noise 2003, Napoli, 19-21 Maggio 2003.
- 12** - *P.Guidorzi, A.Cocchi*. Costruzione e Analisi Sonora dell'Organo ad Acqua di Leonardo. Atti del 31' Convegno Nazionale AIA, Venezia, 5-7 Maggio 2004.
- 13** - *P.Guidorzi, R.Guidorzi*. Frisch Filtering of Noisy Signals, Proceedings of EUSIPCO 98, Rhodes, Greece, 8-11 September 1998.
- 14** - *P.Guidorzi*. Il controllo attivo del rumore, *INARCOS*, 656, *Gennaio/Febbraio 2005, anno LX*
- 15** - *M.Garai, P.Guidorzi*. Collaudo acustico in situ delle caratteristiche acustiche intrinseche delle barriere antirumore lungo la linea ferroviaria A.C. Torino-Novara, *Atti del 33' Convegno Nazionale AIA, Ischia, 10-12 Maggio 2006*.
- 16** - *M.Garai, P.Guidorzi*. Case history: in situ verification of the intrinsic characteristics of the acoustic barriers installed along a new high speed railway line, Proceedings of InterNoise 2006, Honolulu, Hawaii, USA, 3-6 December 2006.
- 17** - *M.Garai, P.Guidorzi*. Using cen/ts 1793-4 to develop an acoustically effective added device for road traffic noise barriers. Proceedings of ICA 2007, Madrid, Spain, 2-7 September 2007.
- 18** - *P.Guidorzi, M.Garai*. Sound absorption measurement using mls method. how much is the final result affected by the non-linearities of the measurement chain? Proceedings of ICA 2007, Madrid, Spain, 2-7 September 2007.
- 19** - *P.Guidorzi, L.Barbaresi, M.Garai*. La misura dell'assorbimento acustico con diverse metodologie: camera riverberante, metodi impulsivi e tubo a onde stazionarie. Atti del 34' Convegno AIA, Firenze, 13-15 Giugno 2007.
- 20** - *P.Guidorzi, G.Semprini*. Il rumore degli impianti aeraulici: tecniche di controllo attive e passive. Atti del convegno SAIE, Bologna, 27 Ottobre 2007. pp 143-160
- 21** - *M.Garai, P.Guidorzi*. In situ measurements of the intrinsic characteristics of the acoustic barriers installed along a new high speed railway linea. *Noise Control Eng. J.* 56 (5), Sept-Oct 2008
- 22** - *P.Guidorzi, M.Garai*. Signal analysis in the sound absorption measurement procedure: The importance of time subtraction and reference surface corrections. Proceedings of Acoustics-08, Paris, France, 29 June-4 July 2008.
- 23** - *D.D'Orazio, P.Guidorzi, M.Garai*. A Matlab Toolbox for the analysis of Ando's factors. Proceedings of 126th AES Convention, Munich, Germany, 7-10 May 2009.
- 24** - *M.Garai, D.Fattori, L.Barbaresi, P.Guidorzi*. La mappa acustica strategica dell'agglomerato di Bologna ai sensi del D. Lgs. 194/05 (**invited paper**). Atti del 36' Convegno AIA, Torino, 10-12 Giugno 2009.

- 25** - *M.Garai, P.Guidorzi*. Effect of slit-shaped leaks on sound insulation of noise barriers (**invited paper**) Proceeding of Inter-Noise 2010. Inter-Noise 2010 "Noise and Sustainability". Lisbon. 13-16 June 2010
- 26** - *M.Garai, P.Guidorzi*. Reflection index measurement on noise barriers with the Adrienne method: source directivity investigation and microphone grid implementation (**invited paper**). Proceedings of Inter-Noise 2011. Osaka, 4-7 September 2011
- 27** - *P.Guidorzi*. Misure di Riflessione, Isolamento e Diffrazione secondo la EN-1793: sviluppo di un sistema di misura multicanale. Atti del 38' Convegno AIA, Rimini, 8-10 Giugno 2011
- 28** - *P.Guidorzi, L.Barbaresi, M.Garai, F.Testoni*. Confronto tra misure di isolamento acustico secondo la normativa ISO-140 e tramite misure impulsive. Atti del 38' Convegno AIA, Rimini, 8-10 Giugno 2011
- 29** - *P.Guidorzi, J.Klepceck, M.Garai*. On the repeatability of Reflection Index measurements on noise barriers. Proceeding of EuroNoise 2012, Prague, 10-13 June 2012
- 30** - *M.Garai, P.Guidorzi, L.Barbaresi*. Progress in sound reflection measurements on noise barriers in situ. Proceeding of Inter-Noise 2012, New York, 19-22 August 2012
- 31** - *P.Guidorzi, M.Garai*. Advancements in sound reflection and airborne sound insulation measurement on noise barriers. OPEN JOURNAL OF ACOUSTICS, vol. 3, p. 25-38, ISSN: 2162-5794c, 2013
- 32** - *M.Garai, P.Guidorzi*. In-situ measurements of sound reflection and sound insulation of noise barriers: validation by means of signal-to-noise ratio calculations. In: Proceedings of 21st International Congress on Acoustics. THE JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA, vol. 133, ISSN: 0001-4966, Montréal, 02-07/06/2013
- 33** - *M.Garai, P.Guidorzi, E.Schoen*. Assessing the repeatability and reproducibility of in situ measurements of sound reflection and airborne sound insulation index of noise barriers. In: Proceedings of AIA-DAGA 2013 Conference. vol. 1, p. 106-1-106-4, Berlino:DEGA, ISBN: 9783939296058, Merano, 18-22/03/2013
- 34** - *P.Guidorzi, M.Garai*. Impulse responses measured with MLS or Swept-sine signals: a comparison between the two methods applied to noise barriers measurements. Proceedings of 134th AES Convention. Roma: AES Italy, ISBN: 9780937803912, 04-07/05/2013
- 35** - *M.Garai, P.Guidorzi*. On the declaration of the measurement uncertainty of airborne sound insulation of noise barriers. Internoise 2013 Innsbruck Austria 15-18 September 2013
- 36** - *M.Garai, P.Guidorzi, et al*. Repeatability and reproducibility of in situ measurements of sound reflection and airborne sound insulation index of noise barriers. ACTA ACUSTICA UNITED WITH ACUSTICA Vol 100. ISSN 1610-1928 (2014)
- 37** - *M.Garai, P.Guidorzi*. Sound reflection measurements on noise barriers in critical conditions. Building and Environment, 94(2), 752-763, (2015)
- 38** - *P.Guidorzi, L.Barbaresi, D.D'Orazio, M.Garai*. Impulse responses measured with MLS or Swept-Sine signals applied to architectural acoustics: an in-depth analysis of the two methods and

some case studies of measurements inside theaters. Proc. 6th International Building Physics Conference IBPC 2015, Torino, Italy, and Energy Procedia, 78, 1611-1616, (2015). ISSN 1876-6102

39 - *F.Morandi, M.Miniaci, P.Guidorzi, A.Marzani, M.Garai*. Acoustic measurements on a sonic crystals barrier. Proc. 6th International Building Physics Conference IBPC 2015, Torino, Italy, and Energy Procedia, 78, 134-139 (2015). ISSN 1876-6102, **Awarded best paper of the congress**.

40 - *M.Garai, P.Guidorzi, F.Morandi, M.Miniaci, A.Marzani*. Sound reflection and sound insulation measurement on a sonic crystal noise barrier according to the new european methodology. Proceeding of Inter-Noise 2015, pp.1-7. NOISE-CON PROCEEDINGS - ISSN:0736-2935

41 - *M.Garai, P.Guidorzi*. Optimizing the exponential sine sweep (ESS) signal for in situ measurements on noise barriers (**invited paper**). Proc. Euronoise 2015, Maastricht, The Netherlands, ISSN 2226-5147, 57-62 (2015)

42 - *D.D'Orazio, P.Guidorzi et al*. Room acoustic measurements using a high-SPL dodecahedron. Proceedings of 140th AES Convention. Paris, 4-7 June, 2016

43 - *L.Barbaresi L., Guidorzi P., et al*. La misura della rigidita' dinamica mediante segnali ESS e MLS. Atti del 43° Convegno A.I.A. Alghero, 25-27 Maggio, 2016

44 - *F.Morandi, P.Guidorzi et al*. La misura della trasmissione laterale nelle strutture in legno: problematiche e metodologie a confronto. Atti 43° Convegno A.I.A. Alghero, 25-27 Maggio, 2016

45 - *P.Guidorzi, M.Garai*. La misura del coefficiente di assorbimento acustico tramite tecniche beamforming. Una prima indagine. Atti 44° Convegno A.I.A. Pavia, 7-9 Giugno, 2017

46 – *P.Guidorzi, L.Barbaresi, M.Garai*. Measuring the dynamic stiffness of resilient materials using ESS and MLS signals, «APPLIED ACOUSTICS», 2018, 138, pp. 92 – 100

47 – *P.Guidorzi, L.Barbaresi, M.Garai, T.Piazza*. Sistema 3D di posizionamento microfonic applicato a indagini di rumore delle macchine, Atti 46° Convegno A.I.A. Pesaro, 29-31 Maggio, 2019

48 – *P.Guidorzi, M.Lorenzini*. Thermal field measurements of heat sinks through a novel three-dimensional method based on acoustic waves, Proc. 74th ATI National Congress, Modena, 11-13 September, 2019, pp. 0200931 – 0200938, ISBN 978-073541938-4

49 – *G.Semprini, A.Jahanbin, B.Pulvirenti, P.Guidorzi*. Evaluation of Thermal Comfort Inside an Office Equipped with a Fan Coil HVAC System: A CFD Approach, «FUTURE CITIES AND ENVIRONMENT», 2019, pp 1-10, E-ISSN: 2363-9075

50 – *P.Guidorzi, F.Pompoli, P.Bonfiglio, M.Garai*. A newly developed low-cost 3D acoustic positioning system: Description and application in a reverberation room, «APPLIED ACOUSTICS», 2020, 160, pp. 107127 – 107132, ISSN 0003-682X

51 – *P.Guidorzi, L.Barbaresi, M.Garai, T.Piazza, T.Pesso*. Analysis of noise emitted by an engine using an innovative 3D microphone positioning system. Proceedings of 2020 International Congress on Noise Control Engineering, INTER-NOISE 2020, 2020

52 – *P.Guidorzi, M.Garai*. Sound insulation measurements on noise barriers across their entire extension: A preliminary study. Proceedings of 2020 International Congress on Noise Control Engineering, INTER-NOISE 2020, 2020

53 – *J.-P.Clairbois, M.Garai, P.Guidorzi, A.Fuchs, C.Nicodeme*. Characterizing noise barriers: SOPRANOISE half-term progress report. Proceedings of INTER-NOISE 2021 - 2021 International Congress and Exposition of Noise Control Engineering, 2021

54 – *L.Russi, P.Guidorzi, B.Pulvirenti, D.Aguiari, G.Pau*. Air quality and comfort characterisation within an electric vehicle cabin. 2021 IEEE International Workshop on Metrology for Automotive, MetroAutomotive 2021 - Proceedings, 2021, pp. 169–174

55 – *L.Russi, P.Guidorzi, B.Pulvirenti, G.Pau, G.Semprini*. Air Quality and Comfort Characterisation within an Electric Vehicle Cabin in Heating and Cooling Operations. Sensors, 2022, 22(2), 543

56 – *E.Santolini, B.Pulvirenti, P.Guidorzi, D.Torreggiani, P.Tassinari*. Analysis of the effects of shading screens on the microclimate of greenhouses and glass facade buildings. Building and Environment, 2022, 211, 108691

57 – *M. Garai; P. Guidorzi; M. Conter; A. Fuchs*. SOPRANOISE: toward a quick measurement method to verify and monitor the acoustic performance of noise barriers on site. Proceedings of the 24th International Congress on Acoustics ICA 2022. 24-28 October 2022, Gyeongju, Korea. Invited paper.

58 – *P. Guidorzi; M. Garai*. A Low-Cost System for Quick Measurements on Noise Barriers in Situ. IEEE Transactions on Instrumentation and Measurement, vol. 71, pp. 1-14, 2022, Art no. 6503714, doi: 10.1109/TIM.2022.3218037

Knowledge transfer:

P.Guidorzi – **Patent** (as “inventor”, registration nr. 102017000066160) in collaboration with *ALMA MATER STUDIORUM - UNIVERSITA' DI BOLOGNA*. “Method for calculating a position and eventual mapping of a space-related variable by using acoustic signals and corresponding device for implementing the method”. Registered 14 june 2017.

Extension to **international patent** nr. *PCT/EP2018/065453*, registered 12 june 2018.

The patent allows to measure several parameters in the three-dimensional space and has several fields of application: for example acoustics, archaeology, thermotechnics.

Teaching activities:

- Lecturer of *Introduction to Signal Theory* seminar at the University of Bologna in the context of the Applied Acoustics course. Academic Year 1998/1999.

- Lecturer of *Signal Theory and Noise Control* seminar at the University of Modena in the context of the Mechanics applied to Machines course. Academic Year 1998/1999.

- Lecturer at the University of Modena for the *Mechanics applied to Machines* course. 1999/2000.
- Lecturer at the University of Bologna for the *Technical Physics* course. Academic Year 2000/2002.
- Speaker of a short-course (organized by University of Bologna in partnership with University of Leuven) titled *Dynamic System identification*, concerning active noise control. Bologna, May 2002.
- Lecturer at the University of Bologna for the *Applied Acoustics and Lighting Technique* and *Environmental Control Technique* courses. Academic Years 2002/2003 and 2003/2004.
- Full member dell'AES (Audio Engineering Society) dal 2002. Peer reviewer for JAES.
- Teacher of *Applied Acoustics and Lighting Technique*, Academic years 2006/2007 and 2007/2008, at the University of Bologna.
- Teacher of *Environmental Control Technique*, Academic year 2008/2009, at the University of Bologna.
- Teacher of *Environmental Technical Physics* at the University of Bologna since Academic year 2008/2009.
- Teacher of *Lighting Technique and Acoustics* at the University of Bologna (Cesena campus), year 2016/2017.
- Member of organizing committee of 38' AIA congress (Italian Acoustical Association), 2011.
- Member of *QUIESST European Project and CIRI, Inter-departmental Center for Industrial Research "Buildings and Constructions"*, since 2010.
- Member of organizing committee of 8th International Symposium on Temporal Design – Bologna 14-15 September 2017
- Lecturer and scientific board member of the *ARDUINO ONE DAY WORKSHOP* - 30 May 2017. "A low-cost help for researchers and students, starting from scratch up to practical examples using sensors and graphic displays" Organized by iSCAPE (Improving the Smart Control of Air Pollution in Europe). In collaboration with the LIVING LAB TERRACINI IN TRANSIZIONE. Tuesday 30 June 2017 at Engineering Faculty, via del Lazzaretto 15, Bologna.

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