



PROF. Elena Pierro

SCIENTIFIC CURRICULUM VITAE:

Elena Pierro was born in Trento (Italy) on November 30, 1981. She gained her Mechanical Engineering Degree *summa cum laude* on November 2005, at Politecnico di Bari, with a final dissertation entitled "Study and dynamic characterization of a microelectromechanical system". In the year 2006 she had the Qualification as a Professional Engineer of the Italian Association of Engineers. Since June 2006 to June 2009 she attended the PhD course in Mechanical Design and Biomechanics at the Department of Mechanical and Management Engineering (DIMEG) of Politecnico di Bari. The topic of the research was "Noise and Mechanical Vibrations in the Design Process of Machines". During the PhD course, she spent 6 month abroad (September 2008 – March 2009), at LMS International HQ, Leuven (Measurement and Systems - Engineering Innovation of Software and Hardware Systems for Noise and Vibration applications, Belgium), where she carried out the following research projects: (i) Modal testing on a fuselage panel made of composite material: comparison of the effects of different measure techniques on the data quality (UNVICO-2 PROJECT) and (ii) Vibro-acoustic modal analysis of the helicopter EUROCOPTER EC-135, (FRIENDCOPTER Project). Since October 2008 to May 2010, she worked as employed at IVECO (FIAT) in Turin (Italy), where her main activities were structural calculations, NVH and durability analyses in light commercial vehicles (Innovation & Advanced Development - Computations & Statistics – LCV). Since June 2010 to December 2011 she was part of the scientific staff at the Department of Mechanical Engineering at Politecnico di Bari. Her main research interests are AFM dynamics, structural vibrations and contact mechanics. Since December 2011 she is Researcher at the School of Engineering (SI-UniBas) of the University of Basilicata (Potenza). In the year 2014 she had the National Academic Qualification as Associate Professor.

PUBLICATIONS:

International Journals:

1. E. Pierro, E. Mucchi, L. Soria, A. Vecchio: "On the vibro-acoustical operational modal analysis of a helicopter cabin"- Mechanical Systems and Signal Processing, Volume 23, Issue 4, May 2009, Pages 1205-1217.
2. L. Soria, E. Pierro, G. Carbone, T. Contursi: "Tuning fork microgyrometers: Narrow gap vs. wide gap design" – Journal of Sound and Vibration, Volume 322, Issues 1-2, 24 April 2009, Pages 78-97.
3. G. Carbone, E. Pierro, S. N. Gorb, "Origin of the superior adhesive performance of mushroom shaped microstructured surfaces", Soft Matter, Volume 7, Issue 12, Pages 5545-5552, 2011.
4. G. Carbone, E. Pierro "Sticky Bio-inspired Micropillars: Finding the Best Shape", Small Volume 8, Issue 9, Pages: 1449-1454 ,May 7 2012.
5. G. Carbone, E. Pierro, "Effect of interfacial air entrapment on the adhesion of bio-inspired mushroom-shaped micro-pillars", Soft Matter, Volume 8, Issue 30, Pages 7904-7908, 2012.
6. G. Carbone, E. Pierro, " The Influence of the Fractal Dimension of Rough Surfaces on the Adhesion of Elastic Materials", Journal of Adhesion Science and Technology, 2555-2570, 2012.
7. G. Carbone, Elena Pierro, " A review of adhesion mechanisms of mushroom-shaped microstructured adhesives", Meccanica, 2013.
8. L. Heepe, G. Carbone, E. Pierro, A. E. Kovalev, S. N. Gorb, "Adhesion Tilt-Tolerancy in Bio-Inspired Mushroom-Shaped Adhesive Microstructure", Applied Physics Letters, 104, 011906, 2014.
9. G. Carbone, E. Pierro, G. Recchia, "Loading-unloading hysteresis loop of randomly rough adhesive contacts", Physical Review E - Statistical, Nonlinear, and Soft Matter Physics, Volume 92, Issue 6, 2015.

International Conferences:

1. E. Pierro, E. Mucchi, L. Soria, A. Vecchio: "EMA and OMA techniques for vibroacoustically coupled systems: the example of a helicopter cabin"- IOMAC 2009, Porto Novo, Ancona, Italia, 4-6 May 2009, pp. 415-422.
2. E. Mucchi, E. Pierro, A. Vecchio, "Experimental guidelines for NVH improvements in helicopter vibro-acoustic comfort" - Proceedings of ASME, ISBN: 978-0-7918-4898-2, the 22nd Biennial Conference on Mechanical Vibration and Noise, August 30-September 2, 2009, San Diego, California, USA.
3. Giuseppe Carbone, Elena Pierro, Leonardo Soria, "Microcantilever dynamics: effect of Brownian excitation in liquids", SEM09 Annual Conference, Albuquerque, New Mexico, June 1-4, 2009.



4. M.Luczak, A. Vecchio, B. Peeters, E. Pierro: "Contact versus Non-contact measurement of a Large Composite Fuselage Panel" - AIVELA, Ancona, 17 June 2008, 8th Intl Conference on Vibration Measurements by Laser Techniques, Proc. of SPIE Vol. 7098.
5. E. Pierro, E. Mucchi, A. Vecchio: "Using P-U probes for the experimental vibro-acoustical modal analysis of a helicopter" - Proceedings of ISMA2008, Leuven, Belgium, 2008, September 15-17, ISBN 978-90-7380-286-5.
6. M.Luczak, A. Vecchio, E. Mucchi, E. Pierro: "Experimental Modal Analysis Of Large Fuselage Panel For Composite Structure: Contact And Non-Contact Measurement"- Proceedings of ISMA2008, Leuven, Belgium, 2008, September 15-17, ISBN 978-90-7380-286-5.
7. L. Soria, E. Pierro, G. Carbone, T. Contursi, L. Mangialardi: "MEMS-based Tuning Fork microgyroscopes: Dynamical response and functional design"- Proceedings of ISMA2008, Leuven, Belgium, 2008, September 15-17, ISBN 978-90-7380-286-5.
8. M. Luczak, A. Vecchio, E. Mucchi, T. Shigeoka, E. Pierro, " Sensor Location Optimization in Experimental Modal Analysis of a Composite Fuselage Panel", PROCEEDINGS OF THE FOURTH EUROPEAN WORKSHOP ON STRUCTURAL HEALTH MONITORING 2008 Book Series: Structural Health Monitoring (SHM) Pages: 922-928 Published: 2008.
9. G. Carbone, E. Pierro, "Theoretical assessment of the adhesion performance of microstructured surfaces", FANAS Conference, October 25 – 28, 2010, Saarbrücken, Germany.
10. G. Carbone, E. Pierro, "Assessment of the Performance of Mushroom-Shaped Micro-Structured Surfaces", ECOTRIB 2011 - 3rd European Conference on Tribology, 7-9 June 2011, Vienna, Austria.
11. G. Carbone, E. Pierro (2012). The amazing adhesion of mushroom shaped microstructured surfaces. In: 2012 Proceedings of the ASME International Mechanical Engineering Congress and Exposition (IMECE2012). Houston, Texas, USA, November 9-15, 2012.
12. L. Afferrante, F. Bottiglione, E. Pierro, G. Carbone (2013). A bio-inspired micro-structured surface with anisotropic adhesion. In: WTC 2013 - 5th world TRIBOLOGY congress. ISBN: 978-88-90818509, Torino, September 8 – 13, 2013.
13. E. Pierro, G. Carbone, L. Afferrante, F. Bottiglione (2013). Adhesive performance of mushroom-shaped micro-pillars with interfacial micro-bubbles of air. In: WTC 2013 - 5th world TRIBOLOGY congress. ISBN: 978-88-90818509, Torino, September 8 – 13, 2013.
14. Bottiglione, L. Afferrante, E. Pierro, G. Carbone (2013). Tuning roughness to design robust superhydrophobic surfaces. In: WTC 2013 - 5th world TRIBOLOGY congress. ISBN: 978-88-90818509, Torino, September 8 – 13, 2013.
15. E. Pierro, F. Bottiglione, G. Carbone, " Experimental and theoretical characterization of a dAFM cantilever dynamics", Proceedings of ISMA2018, Leuven, Belgium, 2018, September 17-19.

National Conferences:

1. L. Soria, E. Pierro, G. Carbone, T. Contursi (2007). Theoretical study of the dynamical response of a MEMS-based gyroscope. In: AIMETA 2007. ISBN: 978-88-89720-69-1, Brescia, Italy, 11- 14 Settembre 2007.
2. G. Carbone, E. Pierro (2011). Superlative adhesion of mushroom shaped microstructured surfaces. In: AIMETA 2011. ISBN: 978-88-906340-0-0, Bologna, 12-15 Settembre 2011.
3. G. Carbone, E. Pierro, L. Mangialardi (2011). Adhesive contact of rough surfaces: the influence of fractal geometry. In: AIMETA 2011. ISBN: 978-88-906340-0-0, Bologna, Italy, 12-15 Settembre 2011.
4. G. Carbone, E. Pierro, G. Recchia (2016). Does roughness make elastic-adhesive contacts dissipative?. In: 5° Workshop AIT "Tribologia e Industria", 21-22 Aprile 2016, Salerno.

Book Chapter:

1. E. Mucchi, E. Pierro, A. Vecchio (2011). Advanced vibro-acoustic techniques for noise control in helicopters. In: (a cura di): Daniela Siano, Noise Control, Reduction and Cancellation Solutions in Engineering. InTech, ISBN: 978-953-307-918-9
2. Carbone G., Pierro E. (2017), Bio-Inspired Structured Adhesives, ISBN: 978-3-319-59114-8, Springer International Publishing, 2017.

PROFESSOR'S OFFICE HOUR:

Thursday, 09.30

Floor V, room 75

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