

WORK EXPERIENCE

2014 to date - Postdoc position in ultrasonic wave - based health monitoring of aeronautical and space systems at the Mechanical and Aerospace Engineering Department of Sapienza University of Rome.

EDUCATION

2010 – 2014 - PhD in Aeronautical and Space Technologies achieved at the Aeronautical Civil and Industrial Engineering faculty of Sapienza University of Rome defending the thesis: "A New Ultrasonic SHM Procedure for Delamination Detection in Composite Structures: Numerical Analyses and Experimental Tests".

2007 – 2010 - MSc in Aeronautical Engineering, cum Laude, achieved at the Civil and Industrial Engineering faculty of Sapienza University of Rome defending the thesis: "Geometrically exact models of thin plates towards nonlinear system identification via higher-order spectral approach".

2004 – 2010 - "Gaetano Marzotto" Business Degree achieved at the "Lamaro Pozzani" hall of residence of Rome.

2004 – 2007 - BSc in Aerospace Engineering, cum Laude, achieved at the Civil and Industrial Engineering faculty of Sapienza University of Rome.

TRAINING

2011 – 2012 - Visiting scientist at Los Alamos National Laboratory, New Mexico, USA, to carry out the PhD thesis project. Core elements of this scientific experience have been the accomplishment of an extensive experimental campaign in the field of high-frequency ultrasonic propagation in solid composite media, which featured the design of innovative testing setups, as well as the development of new solutions in the field of actuating/sensing system schemes for damage detection purposes driven by the implementation of multi-physic numerical simulations in the range of ultrafast elastodynamics.

2009 – 2010 - Visiting student at Clarkson University of Potsdam, New York, USA, to carry out the MS thesis project. The work of research has seen the derivation of a new accurate physics-based mathematical model of composite laminates as well as the development of an innovative damage detection strategy based on higher-order spectral analysis, its subsequent direct implementation in a numerical code for finite element analyses and the realization of a complete experimental campaign to validate the theoretical predictions and the obtained numerical results.

AWARDS AND FELLOWSHIPS

- **US NAVY research grant** as visiting scholar at Clarkson University, New York, USA, to carry out the MS thesis project.
- **Winner of the "Liviu Librescu" national prize** for the best MS thesis in the field of Aerospace Structures.
- **Fellowship from the Sapienza Research Program** to support the best research projects carried out by PhD students.
- **Fellowship from the Graduate Student Mobility Program** of Sapienza University of Rome (first placed).

COMPETENCES

- **Advanced structural health monitoring:**
 - M. Pasquali, W. Lacarbonara, (2015), "Delamination detection in composite laminates using high-frequency P- and S-waves: Part I - Theory and analysis", *Composite Structures*, doi:10.1016/j.compstruct.2015.05.019.
 - M. Pasquali, W. Lacarbonara, C.R. Farrar, (2015), "Delamination detection in composite laminates using high-frequency P- and S-waves: Part II - Experimental validation", *Composite Structures*, doi:10.1016/j.compstruct.2015.05.042.
 - P. Gaudenzi, D. Nardi, I. Chiappetta, S. Atek, L. Lampani, M. Pasquali, F. Sarasini, J. Tirilló, T. Valente, (2015), "Sparse sensing detection of impact-induced delaminations in composite laminates", *Composite Structures*, doi:10.1016/j.compstruct.2015.08.052
 - D. Nardi, L. Lampani, M. Pasquali, P. Gaudenzi, (2016), "Detection of low-velocity impact-induced delaminations in composite laminates using Auto-Regressive models", *Composite Structures*, doi:10.1016/j.compstruct.2016.02.005.
- **Modelling of high-velocity impact dynamics:**
 - M. Pasquali, C. Terra, P. Gaudenzi (2015), "Semi-analytical model of high-velocity impacts on thin woven fabric composite targets", *Composite Structures* 131, pp. 951-965.
- **Nonlinear modelling of multi-physics continua:**

- M. Pasquali, P. Gaudenzi, (2015), "A nonlinear formulation of piezoelectric shells with complete electro-mechanical coupling", *Meccanica*, DOI: 10.1007/s11012-015-0144-x.
- M. Pasquali, P. Gaudenzi, (2015), "A nonlinear piezoelectric shell model: Theoretical and numerical considerations", *Intelligent Material System and Structures*, DOI: 10.1177/1045389X15575087
- M. Pasquali, P. Gaudenzi (2012), "A nonlinear formulation of piezoelectric plates", *Intelligent Material System and Structures* 23, pp. 1713-1723.
- **Nonlinear structural identification:**
 - M. Pasquali, W. Lacarbonara, P. Marzocca, (2013), "Detection of nonlinearities in plates via higher-order-spectra: numerical and experimental studies", *Vibration and Acoustics* 136, pp. 1-13.
 - M. Pasquali, C.R. Farrar, C.J. Stull (2014), "Info-gap robustness of an input signal optimization algorithm for damage detection", *Mechanical Systems and Signal processing* 50, pp. 1-10.
- **Nonlinear mechanics of composite structures:**
 - W. Lacarbonara, M. Pasquali (2011), "A geometrically exact formulation for thin multi-layered laminated composite plates: theory and experiment", *Composite Structures* 93, pp. 1649-1663.
- **Reviewer for international research journals and science and technology books:**
 Journal of Aircraft (American Institute of Aeronautics and Astronautics), Journal of Composite Structures, Journal of Sound and Vibration, Journal of Vibration and Control, Journal of Vibration and Acoustics, Journal of Electrical Power and Energy Systems.

TECHNICAL SKILLS

- **FEM analysis:**
 - COMSOL Multiphysics: Heat transfer (Static and transient analysis); Structural mechanics (Nonlinear load path estimation, Transient analysis, Eigenvalue problem solution, Boundary problem solution); Nonlinear structural materials (Hysteretic behavior, Dissipation); Multibody dynamics (Contact pairs); Acoustics (P- and S-wave propagation, Lamb waves propagation, Rayleigh waves propagation, Strip-like apertures in half-space domains); Wave optics; Ray Optics;
 - NASTRAN: Linear static and normal modes analysis; Dynamic analysis; Design sensitivity and optimization.
 - ADINA: Structural optimization (MOS/FOS estimation; Frequency range control; Weight budget reduction).
 - ANSYS: Thermoelastic analysis; Thermal expansion tolerance; Active/passive cooling; Design optimization.
- **Symbolic computation:**
 - MATHEMATICA: Knowledge of core language and structure; Model building via symbolic computation; Data manipulation, analysis and visualization; AE/ODE system solving; Geometric computation; Algorithm building.
- **Numerical computation:**
 - MATLAB: Knowledge of the language fundamentals (syntax, operators, data types); Use of mathematics, (Linear algebra, Basic statistics, Differentiation and integrals, Fourier transforms, and other mathematics); Data visualization (Two- and three-dimensional plots, Animation); Programming scripts and functions (Program files, Control flow, Editing, Debugging), Data Import and export; GUI Building; Desktop Environment.
 - SIMULINK: Design of time-varying systems (Flight simulators); Component-Based Modeling; System validation;
 - FORTRAN: High-accuracy solving of PDE problems (Fourier equation, D'Alembert equation, Laplace equation).
- **Signal design, acquisition, conditioning and post-processing:**
 - LABVIEW: Data acquisition and analysis, Excitation signal design; Probe calibration; Data imaging and review.
 - NI PXI platform: NI PXIe-4461, NI PXIe-4462, NI PXIe-4464 (Signal acquisition); NI PXIe-4463 (Signal generation).
 - Audio and RF power amplification: ENI a-300 RF Power amplifier, PI E-665 Piezo-amplifier.
 - Signal generation, acquisition and analysis: RIGOL DG-1000; RIGOL DS-1000E; RIGOL DSA-800.
- **Structural testing: static analyses**
 - Loading: MTS 809 Axial/Torsional system (Load path measurement for isotropic/composite laminated panels);
 - Displacement/strain measurement: Micro-Epsilon DTA Series (LVDT), OMEGA KFH Series (Strain gauges).
- **Structural testing: dynamic analyses**
 - Loading: Brüel & Kjær 4808 PVDF (electro-dynamic shaker); LANSMONT MS-400 (shaking table).
 - Displacement/Velocity/Acceleration measurement: Polytec PSV-400 (Laser scanner vibrometer), PI piezo-patches.
- **Editing:**
 - Word processors: TeXMaker; WinEdt; MiKTeX; GNU TeXmacs; Google Docs; Microsoft Word.
 - Results presentation: Beamer; Microsoft Power Point; KeyNote; Golden Grapher; Adobe Illustrator.

INTERESTS

Learning. As a scientific researcher, I am keen on deepening my understanding of the world around me. I address my curiosity towards the most different topics: foreign literature, scientific epistemology, oriental philosophies, history. The weirder, the better.

Touring. Travelling can really widen our gaze. I am an enthusiast motorcycle tourer. I jump on my bike whenever possible.

Sport: Mens sana in corpore sano. Keeping a healthy body is the key to a focused mind in today's hectic society. And, it is fun.