

Angelo De Fenza

Expert in Structural Health Monitoring on Advanced Composite Materials with experience in Vibro-Acoustics and Structural Dynamics

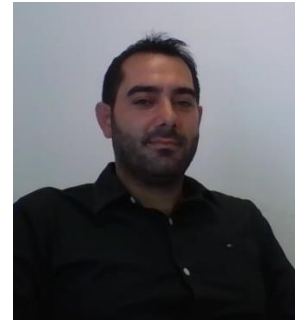
Born in Naples (Italy) on September 10th, 1982

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Marital status: married, father of two sons



▪ Education

2008-2011	Ph.D. in Aerospace Engineering at the University of Naples, “Federico II” <i>Research Topic: “Experimental and Numerical Estimation of Damping in Composite Plates with Embedded Viscoelastic Treatments”</i> <i>Research was aimed to develop numerical and experimental techniques for the dynamic behavior characterization (about damping) of composite material structures realized with embedded viscoelastic damping treatments for noise and vibration control at high and medium frequencies.</i>
2005-2008	Master Degree in Aerospace Engineering at the University of Naples, “Federico II” <i>Thesis subject: “Acoustic Analysis and High Cycle Fatigue (HCF) Life Evaluation for a Low Pollutants Emission Combustor”.</i>
2001-2005	Bachelor Degree in Aerospace Engineering at the University of Naples, “Federico II” <i>Thesis subject: “Maintenance Process Analysis for Alitalia MD-80 aircrafts and Job-Interruption Evaluation”</i>

▪ Academic experiences

Since July 2018	Visiting Professor in Aerospace Manufacturing at the University of Madrid Carlos III, where he is coordinator of two courses at master and bachelor degrees related with the design and manufacturing of component and parts, even in composite material, for aerospace applications.
Since 2012 to 2014	Research Assistant at the Department of Industrial Engineering (Aerospace section) of the University of Naples, “Federico II” where he developed, together with the Italian Aerospace Research Center (C.I.R.A) that supported his research fellowships, a Structural Health Monitoring system for wing-box of an UAV. In collaboration with the C.I.R.A. structure research group he has been the key developer of several tools able to detect damage status, and in the meanwhile reproducing experimental observation via numerical simulations.
2014	Invited Lecturer for the SEAMIAero Master (System Engineering approach for Advanced Materials application in Aeronautics) organized by the Department of Industrial Engineering of University of Naples, Federico II.
2011-2014	Assistant Lecturer (in collaboration with Prof. L. Lecce - Full Professor of Aircraft Structures at University of Naples, Federico II) for the numerical lab of the Advanced Aerospace Structures course. The lectures were focused on the airframe structural sizing and design with particular attention on a real case of an aircraft's wing-box sizing.
2013	Invited Lecturer at the ASIA project (supported by the DTA - Aerospace Technological District of the Puglia (Italy)). The project was aimed to educate technicians specialist in the design and sizing of wing structures in composite materials.

2012	Invited Lecturer for the numerical lab at the Summer School in Advanced Composite Materials in Serres (Greece), organized by IIMEC. He presented the capabilities of GENOA tool referred to some real cases.
Since 2008	He supported more than 20 students, during their preparation of the bachelor / master degree thesis.

▪ **Involvement in Research projects**

2018	He submitted as <i>Project Coordinator</i> the EU-CS2 Call for Proposal “ ENCANTO ” (Full-scale innovative pressure bulkheads for Regional Aircraft Fuselage barrel on-ground demonstrators) aimed to develop, verify and validate manufacturing-oriented design concepts enabling the fabrication of full-scale composite pressure bulkheads using Out of Autoclave Liquid Resin Infusion (LRI) process and the Automated Fiber Placement (AFP) one. The proposal is currently under evaluation.
2017/2018	He submitted as <i>Team Leader</i> of the structural design and sizing activities the “ SEAGULL ” project, aimed to develop an innovative ultralight amphibious aircraft with folding wing. The project was funded with 1.4M€ by the Italian Ministry of the Economical Development (MISE) (Law 808/85).
2016/2018	He gave a scientific contribution within the following projects: AirGreen2 - H2020-CleanSky2 - (H2020-CS2-CPW01-2014-01): aims at developing and demonstrating, in a relevant environment, innovative concepts, and methodologies, enabling the realization of a wing of new generation. This wing will be characterized by an innovative structure, result of an improved life cycle design; a high level of adaptivity, enabling load control and alleviation strategies and enhancing the aerodynamic performance at the different flight regimes; NHYTE - HORIZON 2020 - (H2020-MG-2016-Two-Stages) – (New Hybrid Thermoplastic Composite Aerostructures manufactured by Out of Autoclave Continuous Automated Technologies): The NHYTE project is developing concepts and methodologies enabling the realization of innovative and green integrated aerostructures made by a recyclable hybrid thermoplastic composite material with multifunctional capabilities. This hybrid material will be fabricated by an innovative machine implementing continuous automated production processes: typical aerostructure (part of wing and fuselage) will be produced by a robotic machine using new process such as Automated Fibre Placement (AFP), continuous forming and will be assembled by induction welding; SWING - (Smart Wing per Nuova Generazione di UAV ad uso civile): the project aims to study composite materials manufacturing processes, design methods for composite materials, actuation systems and SHM methods in order to apply them at an innovative UAV for civil applications; COGEA - (COMposite certification in General Aviation): the project aims to study and develop innovative design methods for the manufacturing of primary and secondary structures in composite materials for very light aircraft (VLA) category.
2017	He submitted as <i>Project Coordinator</i> the EU-CS2 Call for Proposal “ NECTAR ” (Layup tools for net-shape AFP-manufacturing of geometrically complex helicopter sideshell sandwich-panels) aimed to develop innovative layup tools for manufacture via AFP of the helicopter sideshell panels. The proposal was not funded by the EU even if the evaluation score overcame the threshold.
2014/2016	He participated as <i>Project Leader</i> at the “ SCAVIR ” research program at Alenia Aermacchi on behalf of Altran Italy and Novotech. The research activities were aimed to optimize the vibro-acoustic behaviour of the fuselage of the new regional aircraft and identify viscoelastic damping materials to use in cabin for noise reduction.

2013/2014	He submitted as <i>Principal Investigator (PI)</i> , the project “ NOWEIGHT (inNOvative Wing-tip equipped with a structural hEalth monitorIng system (SHM) for a fail-safe fliGHT)” at the SIR program (Scientific Independence of young Researcher). The proposal was not financed for lack of funds, even if the thecnical evaluation score overcomed the threshold.
2013	He participated as <i>Team Leader</i> at the “ FAIL SAFE WINGLET ” project aimed to study and develop an innovative winglet having an integrated structural health monitoring system (SHM) in order to monitor and control the damage initiation and propagation on composite material.
2012	He gave a scientific contribution within the “ VIRTUAL DROP TEST ” project (funded by Vulcan Air S.p.a - General Aviation aircraft manufacturer) aimed to develop a numerical approach able to reproduce the drop test of an aircraft landing gear.
2011	He gave a scientific contribution within the test campaign of “ ARCA “ project (optimization of the Acoustic propeRties of Composite material for Aeronautic application) developing a tool in Matlab environmental usefull to evaluate the structural damping starting frome the dynamic behavior of the tested structures.
2011	He gave a scientific contribution within the “ ALENET ” project (ALEnia Networked Enterprise Transformation) aimed to define the guidelines for improving the passengers’ COMFORT.
2010	He gave scientific contribution within the “ NEWAC ” European research project (NEW Aero engine Core concepts) (research contract AVIO-DIAS Rif. 8WH000.7 of the 10/05/2007). He followed, as test engineer, the NEWAC full annular combustor rig tests, aimed to characterize the dynamic behavior of the combustor under the real flight conditions (T,P). The test campaign was performed at ONERA facility placed in Saclay - Paris (France).

▪ Work Experiences

04/2016 06/2018	<i>Engineer consultant</i> in the field of Vibro-Acoustic and Structural Dynamics NOVOTECH – Aerospace Advanced Technology Piazza G. D’Annunzio 15, Naples
09/2014 03/2016	<i>Engineer consultant</i> in the field of Vibro-Acoustic and Structural Dynamics. ALTRAN Italy (Aerospace and Defense division) Via S. Lucia, Naples (Italy)
12/2012 09/2014	Researcher in the field of structural health monitoring (SHM) applied on composite material structures (research fellowship supported by CIRA – Italian Aerospace Research Center) University of Naples, “Federico II” - Dept. of Industrial Engineering, Aerospace sect.
2012	Application engineer consultant in the field of Composite Materials Alpha Star Corporation 5150 E. Pacific Coast Highway, Suite 650 90804 – Long Beach, California - USA
08/2009 10/2009	Collaboration and Training about GENOA software Alpha Star Corporation 5150 E. Pacific Coast Highway, Suite 650 90804 – Long Beach, California – USA <i>Working with GENOA software in the areas of Advanced Materials & Structures focused especially on Composite Material Characterizations and Progressive Failure Analysis - Structural Dynamics Analysis using PSD (Power Spectral Density) load conditions.</i>

10/2007 02/2008	<p>Internship at ATR (Avions de Transport Régional) 1 Allée Pierre Nadot – Blagnac cedex – France</p> <p><i>Internship work: “Reconfiguration Working Party: planning and cost estimation for second hand aircraft”</i></p>
10/2004 02/2005	<p>Internship at ATITECH S.P.A. Capodichino Airport, Naples - Italy</p> <p><i>Internship work: “Maintenance Process Analysis for Alitalia MD-80 aircrafts and Job-Interruption Evaluation”.</i></p>

▪ **Awards**

- 2016: “Innovation Award Leonardo Finmeccanica 2016” for the innovative proposal in the field of acoustic and vibrations control, titled: “A hybrid model of active noise vibration control for a Turboprop Regional Aircraft”;
- 2009: Awarded with a fellowship “CampaniAerospace” to spend a period of 3 months at Alpha Star Corporation, California - USA as a visiting researcher under the supervision of Chief Scientist F. Abdi.

▪ **Patents**

- 2018: He is finalizing a patent for a passive bi-frequential device for noise and vibration control in turboprop aircraft;

▪ **Publications**

Journal Articles

1. A. De Luca, D. Perfetto, A. De Fenza, G. Petrone, F. Caputo, “Guided Lamb waves in a composite winglet structure: numerical and experimental investigations”, Composite Structures, 2018 (in-Press);
2. A. De Luca, D. Perfetto, A. De Fenza, G. Petrone, F. Caputo, “A sensitivity analysis on the damage detection capability of a Lamb waves based SHM system for a composite winglet”, Structural Integrity Procedia, 2018 (in-Press);
3. A. De Luca, D. Perfetto, G. Petrone, A. De Fenza, F. Caputo, “Guided-Waves in a Low Velocity Impacted Composite Winglet”, Key Engineering Materials, Vol.774, pp.343-348, 2018;
4. A. De Fenza, G. Petrone, R. Pecora, M. Barile, “Post-impact damage detection on a winglet structure realized in composite material”, Composite Structures, Vol. 169, pp. 129-137, 2017;
5. A. Sorrentino, A. De Fenza, “Improved elliptical triangulation method for damage detection in composite material structures”, Journal of Mechanical Engineering Science - Special Issue on SHM – Vol. 231 Issue 16, page(s): 3011-3023, August 2017;
6. M. Arena, A. De Fenza, M. Di Giulio, A. Paonessa, F. Amoroso, “Progress in studying passive and active devices for fuselage noise reduction for next generation turboprop”, CEAS Aeronautical Journal, Vol. 8, Issue 2, pp 303–312, 2017;
7. M. Ciminello, A. De Fenza, I. Dimino, R. Pecora, “Skin-spar failure detection of a composite winglet using FBG sensors”, Archive of Mechanical Engineering, Vol. 64 (3), pp. 287-300, September 2017;
8. F. Amoroso, A. De Fenza, G. Petrone, R. Pecora, “A sensitivity analysis on the influence of the external constraints on the dynamic behavior of a low pollutant emissions aircraft combustor-rig”, Archive of Mechanical Engineering, Vol. 63 (3), pp. 435-454, 2016;
9. A. De Fenza, E. Monaco, F. Amoroso, L. Lecce, “Experimental approach in studying the temperature effects on composite material structures realized with viscoelastic damping treatments”, Journal of Vibration and Control, Vol. 22 (2), pp. 358-370, February 2016;
10. A. De Fenza, A. Sorrentino, P. Vitiello, “Application of artificial neural networks and probability ellipse methods for damage detection using Lamb waves”, Composite Structures, Volume 133, 1 December 2015, pp. 390-403;

11. R. Di Leo, A. De Fenza, M. Barile, L. Lecce, "Performances' estimation by tests of composite material structures with respect to the lay-up configuration and mixing the position of tape and fabric laminae", Archive of Mechanical Engineering, volume 62 issue 4, December 2015, pp. 553-564;
12. A. De Fenza, D. D'Orazio, M. Barile, L. Lecce, "Development of Finite Element Model for Morphing Inflatable Winglet", The Journal of Aerospace Science Technology and Systems, Vol. 94 n.2 April-July 2015 (www.aerotecnica.eu);
13. M. Esposito, M. Barile, A. De Fenza, R. Di Leo, L. Lecce, "Multi-body Model Validation of a Landing Gear System for a General Aviation Aircraft", The Journal of Aerospace Science Technology and Systems, Vol. 93 n.3-4 July-December 2014 (www.aerotecnica.eu);
14. R. Di Leo, A. De Fenza, M. Barile, L. Lecce, "Drop Test Simulation for An Aircraft Landing Gear Via Multi-Body Approach", Archive of Mechanical Engineering, volume 61 issue 2, January 2014;
15. E. Daniele, A. De Fenza, P. Della Vecchia, "Conceptual Adaptive Wing Tip Design for Pollution Reductions", Journal of Intelligent Material Systems and Structures (JIMSS), July 2012, vol.23, no.11, 1197-1212;

Ph.D Dissertation

16. A. De Fenza, "Experimental and numerical estimation of damping in composite plates with embedded viscoelastic treatments", Ph.D. dissertation, 2012, ISBN:978-88-66185-15-4;

Conference Full-Papers

17. A. De Fenza, M. Arena, L. Lecce, "Innovative passive multifrequency propeller device for noise and vibration reduction in turboprop fuselage", EASN-CEAS Conference, Glasgow UK, September 2018;
18. A. Sorrentino, A. De Fenza, F. Romano, U. Mercurio, "Experimental application of Lamb wave based SHM system at Complex composite material structures", The 9th European Workshop on Structural Health Monitoring (EWSHM), Manchester UK, July 2018;
19. A. Sorrentino, A. De Fenza, "Damage detection in complex composite material structures by using elliptical triangulation method", 11th IWSHM - Stanford, California, USA, September 2017;
20. F. Abdi, E. Clarkson, C. Godines, S. DorMohammadi, A. De Fenza, "A-B Basis Allowable Test Reduction Approach and Composite Generic Basis Strength Values", 57th AIAA Structures, Structural Dynamics, and Materials Conference, San Diego - California, 4-8 January 2016;
21. P. Caso, E. Daniele, P. Della Vecchia, A. De Fenza, "CFD sensitivity analysis on bumped airfoil characteristics for inflatable winglet", 4th CEAS Air & Space Conference, Linkoping (Sweden), September 2013, ISBN:978-91-7519-519-3;
22. P. Ruocco, P. Romano, A. De Fenza, D. D'Orazio, M. Barile, L. Lecce, "Development of a finite element model for inflatable winglet", XXII AIDAA National Congress, Naples (Italy), September 2013, ISBN:978-88-906484-2-7;
23. M. Esposito, M. Barile, A. De Fenza, R. Di Leo, L. Lecce, "Multi-body model validation of a landing gear system for a general aviation aircraft", XXII AIDAA National Congress, Naples (Italy), September 2013, ISBN:978-88-906484-2-7;
24. R. Di Leo, A. De Fenza, M. Barile, D. Moccia, L. Lecce, "Multi-Body Approach to the Simulation of Particular Drop Test for an Aircraft Landing Gear", ECCOMAS - Multibody Dynamics conference, Zegreb (Croatia), July 2013, ISBN:978-953773822-8;
25. A. De Fenza, E. Daniele, D. Borrelli, M. Di Giulio, L. Lecce, "Air vent noise prediction for a commercial aircraft's environmental control system", NOVEM 2012 Noise and Vibration: Emerging Methods, Sorrento (Naples)- Italy, 1-4 April 2012, ISBN:978-88-90648-40-3;
26. F. Amoroso, A. De Fenza, M. Linari, M. Di Giulio, L. Lecce, "Energy Finite Element Analysis (EFEA) approach for fuselage noise prediction", NOVEM 2012 - Noise and Vibration: Emerging Methods, Sorrento (Naples)-Italy, 1-4 April 2012, ISBN:978-88-90648-40-3;
27. F. Amoroso, A. De Fenza, E. Monaco, R. Pecora, L. Lecce, "Evaluation of vibro-acoustic behavior of composite fuselage structures realized with embedded viscoelastic damping

- treatments”, The international Conference of the European Aerospace Societies (CEAS), Venice (Italy), 24-28 October 2011, ISBN:978-88-96427-18-7, pag.2027-2034;
28. F. Amoroso, A. De Fenza, E. Monaco, R. Pecora, L. Lecce, “Experimental evaluation of vibro-acoustic behavior of composite fuselage structures realized with embedded viscoelastic damping treatments”, The 18th ICSV International Congress on Sound & Vibration - Rio De Janeiro (Brazil), July 2011, ISBN:978-161839259-6;
29. F. Amoroso, A. De Fenza, P. Volpe, E. Monaco, R. Pecora, L. Lecce, “Improved impulse response decay method (IRDM) for structural damping measurements”, The 17th ICSV International Congress on Sound & Vibration - Cairo (Egypt), July 2010, ISBN:978-161782255-1;
30. F. Amoroso, A. De Fenza, R. Pecora, V. Cirillo, L. Lecce, “Dynamic and acoustic analysis for a low NOX emission combustor”, XX AIDAA National Congress - Milan (Italy), 2009, ISBN: 978-88-904668-0-9;

Conference Presentations

31. A. Sorrentino, A. De Fenza, P. Vitiello, “Damage detection using artificial neural networks (ANN) and probability ellipse (PE) methods via Lamb waves approach”, The 18th ICCS International Conference on Composite Structures, Lisbona (Portugal) – June 2015;
32. F. Abdi, N.J. Greene, A. De Fenza, F. Talagani, “Composite Pressure vessel (COPV) Manufacturing Process Effect on Tank Durability and Reliability”, Fracture control of spacecraft, launchers and their payloads and experiments - ESA, ESTEC - Noordwijk (The Netherlands), 20th-21th March 2013;
33. E. Eren, A. De Fenza, K. Nikbin , “Crenellation Effects in Weight Reduction and Increasing Fatigue Lifetimes in Aircraft Panel Structures”, Fracture control of spacecraft, launchers and their payloads and experiments - ESA, ESTEC - Noordwijk (The Netherlands), 20th-21th March 2013;
34. P. Ruocco, P. Romano, A. De Fenza, D. D’Orazio, M. Barile, L. Lecce, “Development of a finite element model for inflatable winglet”, XXII AIDAA National Congress, Naples (Italy), 2013;
35. E. Daniele, A. De Fenza, P. Della Vecchia, “Adaptive wing-tip design for pollution reduction”, Business Improvement by Performance Simulation in A& D, Italian Aeronautical Academy - Naples (Italy), 11th-12th October 2012;
36. A. De Fenza, F. Abdi, R. Ragalini, “Composite structure simulation using MCQ software”, New technology breakout session, Business Improvement by Performance Simulation in A& D , Italian Aeronautical Academy - Naples (Italy), 11th-12th October 2012;
37. F. Amoroso, V. Picco, A. De Fenza, R. Pecora, V. Cirillo, L. Lecce, “Probabilistic approach in studying the effects of the external constraints on the dynamic behavior of an aircraft combustor”, AERO 2011 in conjunction with the CASI 57th AGM, At Montreal QC, Canada, 2011.

▪ **Other Work Experiences**

Mar-Apr 2010	<i>High Cycle Fatigue life evaluation (analysis and tests) of a combustor chamber of aerospace engine</i> Collaboration between Dept. of Aerospace Engineering, Federico II University of Naples, AVIO Aerospace Propulsion and ONERA (Paris - France)
Aug 2009	<i>Experimental modal analysis for a combustor chamber of aerospace engine</i> Collaboration between Dept. of Aerospace Engineering, Federico II University of Naples and AVIO Aerospace Propulsion
Apr-May 2009	<i>Experimental damping measurements for composite fuselage structures realized with Embedded Viscoelastic Damping Treatment</i> Collaboration between Dept. of Aerospace Engineering, Federico II University of Naples and ALENIA Aeronautica (A.R.C.A. research project)

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May-Sep 2008	<i>Structural and acoustic analysis</i> Collaboration between Dept. of Aerospace Engineering, Federico II University of Naples and AVIO Aerospace Propulsion
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▪ **Personal Skills**

Languages	Italian	mother tongue
	English	good
	French	basic
Certification	Wall Street Institute, pre-intermediate level in English (Waystage 2), 2006	
Technical	Programming	C++, Matlab
	Software	GENOA, Catia (V5), MD NASTRAN, MSC Patran, HyperWorks, LateX, Virtual Lab, MathCad , StarCCM+, Actran, Photoshop
	O.S.	Linux (Fedora, Ubuntu), Windows
	Certification	<ul style="list-style-type: none"> - ALTAIR OPTISTRUCT Optimization: course organized by Altair engineering s.r.l. - ALTAIR RADIOSS block: course about multidisciplinary finite element solver (RADIOSS) based on explicit approach - GENOA: training course in Advanced Composite Materials & Structures using GENOA software - Microsoft Office Specialist in Excel 200, 1999