

# Antonio Zippo

## Personal Details

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<b>Full Name</b>	Dr. Antonio Zippo
<b>Present Position</b>	Associate Professor
<b>Organization</b>	University of Modena and Reggio Emilia
<b>Contact address</b>	University of Modena and Reggio Emilia Department of Engineering “Enzo Ferrari” Via P. Vivarelli 10 - 41125 - Modena - Italy
<b>Mobile</b>	_____
<b>E-m@il</b>	antonio.zippo@unimore.it
<b>Scopus Author ID</b>	56196024100
<b>ORCID</b>	<a href="http://orcid.org/0000-0001-6206-2619">http://orcid.org/0000-0001-6206-2619</a>
<b>Total years research experience</b>	14 years

## Academic qualifications

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- PhD in High Mechanics and Automotive Design & Technology** [Sep 2010 - Mar 2013]  
Università di Modena e Reggio Emilia - Modena, Italia  
Title: Nonlinear dynamics and active vibration control of thin walled structures  
Topic: Mechanical vibration. active vibration control, chaos. nonlinear dynamics.
  
- Qualification as a Professional Industrial Engineer**  
Sez. A, Industrial Engineering, passed in 2009
  
- MSc in Mechanical Engineering** [16 Jul 2009]  
Università di Modena e Reggio Emilia - Modena, Italia  
Title: Spherical Tuned Liquid Damper  
Topic: Tuned liquid mass damper, mechanical vibration
  
- BSc in Mechanical Engineering** [27 Jun 2006]  
Università di Modena e Reggio Emilia - Modena, Italia  
Title: L'Aerogeneratore di Cardigliano (LE) [Wind Turbine in Cardigliano]  
Topic: Site and Wind Study, wind turbine power curves analysis, business plan

## University teaching activity

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- Dynamic testing of vehicles in MSc Advanced Automotive Engineering at Department of Engineering "Enzo Ferrari" since academic year 2023/2024 [30 attending students]
- Predictive Maintenance in MSc Mechanical Engineering at Department of Engineering "Enzo Ferrari" since academic year 2023/2024 [60 attending students]
- Mechanics of vehicle in BSc Mechanical Engineering at Department of Engineering "Enzo Ferrari" since academic year 2019/2020 [250 attending students]
- Multibody Dynamics in MSc Mechanical Engineering at Department of Engineering "Enzo Ferrari" since academic year 2017/2018 [60 attending students]
- Mechanical Vibrations in MSc Advanced Automotive Engineering at Department of Engineering "Enzo Ferrari" since academic year 2017/2018 [100 attending students]
- Mechanism and Machine Theory in BSc Mechanical Engineering at Department of Engineering "Enzo Ferrari" in academic year 2018/2019, 2019/2020 [180 attending students]

## Professional positions held

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- **Associate Professor** [01 June 2023 - present]  
Position: Associate Professor of Mechanism and Machine Theory  
Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Italia
- **Senior Lecturer** [01 June 2020 - 31 May 2023]  
Position: Ricercatore a t.d. - t.pieno (art.24 c.3-B L.240/10)  
*Area scientifico-disciplinare 09 Ing. Industriale e dell'informazione*  
*Settore scientifico-disciplinare ING-IND/13 Meccanica Applicata alle Macchine*  
*Settore concorsuale 09/A2*  
Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Italia
- **Lecturer** [1 June 2017 - 31 May 2020]  
Position: Ricercatore a t.d. - t.pieno (art.24 c.3-A L.240/10)  
*Area scientifico-disciplinare 09 Ing. Industriale e dell'informazione*  
*Settore scientifico-disciplinare ING-IND/13 Meccanica Applicata alle Macchine*  
*Settore concorsuale 09/A2*  
Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Italia
- **Post-Doc Research Grant** [1 July 2016 - 30 June 2017]  
Validazioni sperimentali a banco ingranaggi nell'ambito del progetto METAGEAR  
Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Italia  
Tutor: Prof. Francesco Pellicano
- **Post-Doc Research Grant** [1 July 2015 - 30 June 2016]  
FORTISSIMO, Simulazione Ingranaggi  
Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Italia  
Tutor: Prof. Francesco Pellicano

- **Post-Doc Research Grant** [16 August 2014 - 30 June 2015]  
INDGEAR - Modellazione e testing di Ingranaggi  
 Dipartimento di Ingegneria “Enzo Ferrari”, Università di Modena e Reggio Emilia, Italia  
 Tutor: Prof. Francesco Pellicano
- **Post-Doc Research Grant** [16 July 2013 - 15 July 2014]  
Sviluppo metodologie per la modellazione di trasmissioni meccaniche  
 Centro Interdipartimentale per la Ricerca Applicata e i Servizi nel settore della Meccanica Avanzata e della Motoristica (INTERMECH) Università di Modena e Reggio Emilia , Italia  
 Tutor : Prof. Francesco Pellicano
- **Research Grant** [16 July 2010 - 15 July 2013]  
Sviluppo metodologie per la modellazione di trasmissioni meccaniche  
 Centro Interdipartimentale per la Ricerca Applicata e i Servizi nel settore della Meccanica Avanzata e della Motoristica (INTERMECH) Università di Modena e Reggio Emilia, Italia  
 Tutor : Prof. Francesco Pellicano
- **Research Internship** [Dec 2009 – July 2010]  
 Università di Modena e Reggio Emilia , Italia  
 Topics: Modelling of mechanical transmissions. Geometric Definition for the simulation of the cutting process. FEM analysis: strain, stress, and evaluation of transmission error.  
 Software development in Fortran, Matlab, C and Python.
- **Visiting PhD student for project on Nonlinear Active Vibration Control of Sandwich Carbon Fiber Plate with piezoceramic actuators** [Aug 2012 - Apr 2013]  
McGill University - Montreal, Canada  
 Tutor : Prof. Marco Amabili

#### PRINCIPAL INVESTIGATOR OR RESEARCHER IN CHARGE IN FUNDED RESEARCH PROJECTS

- **Coordinator of project: “International higher education school in NVH for Industry 4.0: Higher education school in NVH for Industry 4.0” - CUP E49J21015490005 total budget €254100 from 18-10-2021 to 31-12-2023**
- **FAR2022 - Identification, modelling and analysis of nonlinear EMG signals of pathological tremor - 27/07/2022 budget: 10.000€ granted in 27-07-2022**
- **“Modeling And Experimental Measurements Of Complex Non-Linear Systems For The Active Control Of Essential And Parkinsonian Tremor”, funded from Consorzio Futuro in Ricerca. budget: €30870 from 09-05-2022 to 31-05-2023**
- **Awarding of the research assignment for the project “DiaPro4.0: Prognostic Diagnostics Industry 4.0 from 21-09-2020 to 31-12-2021**

## PARTICIPATION IN FUNDED RESEARCH PROJECTS

- ❑ **Composite Metamaterials for Aerospace Structures - CoMeta** funded within Science for Peace and Security Programme - NATO
- ❑ Regional project “**THEORETIC** - digiTal twin of Electric powErtrains fOr moRE susTainable agrICulture” (PG/2023/308268) PR FESR 2021-2027 AZIONE 1.1.2
- ❑ Regional project “**REFIMAN** Piattaforma di MANutenzione predittiva per il REtroFltting sostenibile di impianti e macchinari esistenti nel sistema produttivo dell’Emilia-Romagna” (PG/2023/304623) PR FESR 2021-2027 AZIONE 1.1.2
- ❑ Regional project “**DIADEM** - Dimostratori di DIAgnostica predittiva e Monitoraggio di componenti elettromeccanici per l’Industria 4.0 mediante lo sviluppo e l’applicazione di un innovativo sensore di DEformazione MEMS per misure non invasive ad altissima risoluzione” (PG/2023/312578) PR FESR 2021-2027 AZIONE 1.1.2
- ❑ **Ecosystem For Sustainable Transition In Emilia-Romagna** funded within (PNRR) – MISSION 4 “Istruzione Ricerca” SPOKE 2
- ❑ **Omnidirectional earthquake isolation system** - University of Waikato
- ❑ **DiaPro 4.0** - Prognostic Diagnostics Industry 4.0, POR-FESR 2014-2020 of the Emilia Romagna Region as part of the Smart Specialization Strategy (S3).
- ❑ **TASC** – Smart & Clean Agricultural Tractors (POR-FESR 2014-2020 of the Emilia Romagna Region - AXIS 1 Research and Innovation - Action 1.2.2 )
- ❑ Regional project “**METAGEAR** Integrated platform for the design and advanced production of industrial gearboxes” (PG/2015 /732270) - POR-FESR 2014-2020.
- ❑ European project **Fortissimo** (FP7), within the project, the participation concerned the HPGA – High Performance Gear Analyzer experiment.
- ❑ European project “**IndGear**: condition monitoring in gear transmissions” (FP7).

## Research publications and dissemination

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### PUBLICATIONS IN INTERNATIONAL JOURNAL

1. Moslem Molaie, Farhad S. Samani, Antonio Zippo, Giovanni Iarriccio, Francesco Pellicano, **Spiral bevel gears: Bifurcation and chaos analyses of pure torsional system**, Chaos, Solitons & Fractals, Volume 177, 2023, 114179, <https://doi.org/10.1016/j.chaos.2023.114179>
2. Molaie, M., Samani, F.S., Zippo, A., Pellicano, F., **Spiral Bevel Gears: nonlinear dynamic model based on accurate static stiffness evaluation** (2023) Journal of Sound and Vibration, 544, art. no. 117395, DOI: 10.1016/j.jsv.2022.117395
3. Zippo, A., Iarriccio, G., Bergamini, L., Colombini, E., Veronesi, P., Pellicano, F., **Fluid-Structure Interaction of a thin cylindrical shell filled with a non-Newtonian fluid** (2023) Journal of Fluids and Structures, 117, art. no. 103829, DOI: 10.1016/j.jfluidstructs.2022.103829
4. Hemmatnezhad, M., Iarriccio, G., Zippo, A., Pellicano, F., **Modal localization in vibrations of circular cylindrical shells with geometric imperfections** (2022) Thin-Walled Structures, 181, art. no. 110079, DOI: 10.1016/j.tws.2022.110079

5. Molaie, M., Deylaghian, S., Iarriccio, G., Samani, F.S., Zippo, A., Pellicano, F., **Planet Load-Sharing and Phasing** (2022) *Machines*, 10 (8), art. no. 634, DOI: 10.3390/machines10080634
6. Moslem, M., Zippo, A., Iarriccio, G., Bergamini, L., Pellicano, F., **Loaded and unloaded tooth contact analysis of spiral bevel gears in consideration of misalignments** (2022) *Insight: Non-Destructive Testing and Condition Monitoring*, 64 (8), pp. 442-446. DOI: 10.1784/insi.2022.64.8.442
7. Iarriccio, G., Zippo, A., Pellicano, F., **Asymmetric vibrations and chaos in spherical caps under uniform time-varying pressure fields** (2022) *Nonlinear Dynamics*, 107 (1), pp. 313-329. DOI: 10.1007/s11071-021-07033-7
8. Zippo A., Iarriccio G., Pellicano F. (2021) **Synchronicity Phenomena in Circular Cylindrical Shells Under Random Excitation**. In: Altenbach H., Amabili M., Mikhlin Y.V. (eds) *Nonlinear Mechanics of Complex Structures*. *Advanced Structured Materials*, vol 157. Springer, Cham. [https://doi.org/10.1007/978-3-030-75890-5\\_8](https://doi.org/10.1007/978-3-030-75890-5_8)
9. Iarriccio G., Zippo A., Pellicano F., Barbieri M. (2021). **Resonances and nonlinear vibrations of circular cylindrical shells, effects of thermal gradients**. *PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS. PART C, JOURNAL OF MECHANICAL ENGINEERING SCIENCE*, p. 1-15, ISSN: 0954-4062, doi: 10.1177/0954406220907616
10. Zippo A., Iarriccio G., Pellicano F., Shmatko T. (2020). **Vibrations of plates with complex shape: Experimental modal analysis, finite element method, and R-functions method**. *SHOCK AND VIBRATION*, vol. 2020, p. 1-23, ISSN: 1070-9622, doi: 10.1155/2020/8882867
11. Zippo, A., Barbieri, M., Iarriccio, G., Pellicano, F., **Nonlinear vibrations of circular cylindrical shells with thermal effects: an experimental study** (2020) *Nonlinear Dynamics*. DOI: 10.1007/s11071-018-04753-1
12. Zippo, A., Barbieri, M., Pellicano, F., **Temperature gradient effect on dynamic properties of a polymeric circular cylindrical shell** (2019) *Composite Structures*, 216, pp. 301-314. DOI: 10.1016/j.compstruct.2019.02.098
13. Gelman L, Harish Chandra N., Kurosz R., Pellicano F., Barbieri M., Zippo A. (2016). **Novel spectral kurtosis technology for adaptive vibration condition monitoring of multi-stage gearboxes**. *INSIGHT*, vol. 58, p. 409-416, ISSN: 1354-2575, doi: 10.1784/insi.2016.58.8.409
14. Pellicano Francesco, Barbieri Marco, Zippo Antonio, Strozzi Matteo (2016). **Experiments on shells under base excitation**. *JOURNAL OF SOUND AND VIBRATION*, vol. 369 , p. 209-227, ISSN: 0022-460X, doi: 10.1016/j.jsv.2015.12.033
15. Zippo Antonio, Barbieri Marco, Pellicano Francesco (2016). **Experimental analysis of pre-compressed circular cylindrical shell under axial harmonic load**. *INTERNATIONAL JOURNAL OF NON-LINEAR MECHANICS*, p. 1-24, ISSN: 0020-7462, doi: 10.1016/j.ijnonlinmec.2016.11.004
16. Zippo Antonio, Ferrari Giovanni, Amabili Marco, Barbieri Marco, Pellicano Francesco (2015). **Active vibration control of a composite sandwich plate**. *COMPOSITE STRUCTURES*, vol. 128, p. 100-114, ISSN: 0263-8223, doi: 10.1016/j.compstruct.2015.03.037

17. Barbieri Marco, Zippo Antonio, Pellicano Francesco (2014). **Adaptive grid-size finite element modeling of helical gear pairs**. MECHANISM AND MACHINE THEORY, vol. 82, p. 17-32, ISSN: 0094-114X, doi: 10.1016/j.mechmachtheory.2014.07.009
18. Masoumi, A; Barbieri, M; Pellicano, F; Zippo, A; Strozzi, M (2017) **Dynamic imbalance of high-speed planetary gears**, International Journal of Condition Monitoring, vol. 7, n. 1, p. 2-6, issn: 2047-6426, doi:10.1784/204764217820441008

#### PUBLICATIONS ON PROCEEDINGS OF INTERNATIONAL CONFERENCES

1. Zippo, A., Iarriccio, G., Pellicano, F., **Nonlinear time series analysis of Parkinsonian tremor signals** (2023) 19th International Conference on Condition Monitoring and Asset Management, CM 2023, DOI: 10.1784/cm2023.4d5
2. Zippo, A., Shmatko, T., Pellicano, F., Kurpa, L., **Free vibration analysis of FGM plates and shallow shells by the R-functions method**, (2023) 19th International Conference on Condition Monitoring and Asset Management, CM 2023, DOI: 10.1784/cm2023.4d7
3. Molaie, M., Ebrahimnejad, R., Zippo, A., Iarriccio, G., Pellicano, F., Samani, F.S., **Nonlinear dynamic behavior of spiral bevel gear by considering the torsional shaft stiffness** (2023) 19th International Conference on Condition Monitoring and Asset Management, CM 2023, DOI: 10.1784/cm2023.4d4
4. Iarriccio, G., Zippo, A., Molaie, M., Pellicano, F., **Nonlinear isolators for civil applications** (2023) 19th International Conference on Condition Monitoring and Asset Management, CM 2023, DOI: 10.1784/cm2023.4d6
5. Molaie, M., Iarriccio, G., Zippo, A., Pellicano, F., Samani, F.S., **COMPLEX DYNAMICS OF SPIRAL BEVEL GEARS** (2023) Proceedings of the International Congress on Sound and Vibration, . <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85170651174&partnerID=40&md5=3bcf27b960b4e3f6f966d680333ba47b>
6. Zippo, A., Pellicano, F., Iarriccio, G., **Microcontroller design for active vibration control**, (2023) Materials Research Proceedings, 26, pp. 479-484. DOI: 10.21741/9781644902431-78
7. Pellicano, F., Zippo, A., Iarriccio, G., **Complex dynamics in non-Newtonian fluid-structure interaction** (2023) Materials Research Proceedings, 26, pp. 449-454. DOI: 10.21741/9781644902431-73
8. Pellicano, F., Zippo, A., Iarriccio, G., **Experiments On Dynamic Non-Newtonian Fluid Interaction With Shells** (2022) ASME International Mechanical Engineering Congress and Exposition, Proceedings (IMECE), 5, art. no. V005T07A109. DOI: 10.1115/IMECE2022-96320
9. Zippo, A., Pellicano, F., Iarriccio, G., **Nonlinear Tsa For Identification Of Dynamic Properties Of Pathological Tremor** (2022) ICONSOM
10. Zippo, A., Pellicano, F., Iarriccio, G., **Experimental investigation of Circular Cylindrical Shell with non newtonian fluid**, (2022) ENOC
11. Iarriccio, G., Zippo, A., Molaie, M., Bergamini, L., Pellicano, F., **Effects of laser surface texturing on the dynamic performance of spur gears** (2022) 18th International Conference on Condition Monitoring and Asset Management, CM 2022, pp. 176-181.

12. Moslem, M., Zippo, A., Iarriccio, G., Bergamini, L., Pellicano, F., **Loaded and Unloaded Tooth Contact Analysis of Spiral Bevel Gear in Consideration of Misalignments** (2022) 18th International Conference on Condition Monitoring and Asset Management, CM 2022, pp. 111-120.
13. Zippo, A., Pellicano, F., Iarriccio, G., **Active Vibration Control based on cost effective microcontroller** (2022) 18th International Conference on Condition Monitoring and Asset Management, CM 2022, pp. 143-153.
14. Zippo, A., Bergamini, L., D'Elia, G., Pellicano, F., Dalpiaz, G., Iarriccio, G., Molaie, M., **Digital Twins: Neural-Networks for the implementation of digital twins of gearboxes** (2022) 18th International Conference on Condition Monitoring and Asset Management, CM 2022, pp. 192-196
15. Iarriccio, G., Molaie, M., Zippo, A., Pellicano, F., **Experiments on a Quasi-zero Stiffness Suspension for Passive Vibration Control** (2022) IFTOMM Mechanisms and Machine Science, 122 MMS, pp. 306-312. DOI: 10.1007/978-3-031-10776-4\_36
16. Pellicano, F., Zippo, A., Iarriccio, G., **Seismic vibration of shells with non-Newtonian fluid interaction: Experiments**, (2021) "Advances in Acoustics, Noise and Vibration - 2021" Proceedings of the 27th International Congress on Sound and Vibration, ICSV 2021.
17. Bergamini, L., Zippo, A., Pellicano, F., Iarriccio, G., Molaie, M., **Gear prognostics: A predictive algorithm for lifetime estimation of operating gearboxes**, (2021) 17th International Conference on Condition Monitoring and Asset Management, CM 2021.
18. Zippo, A., Pellicano, F., Iarriccio, G., Bergamini, L., D'Elia, G., Dal Piaz, G., **Gear diagnostic: Experimental data comparison of radial accelerometers, tangential accelerometers and torque-meter**, (2021) 17th International Conference on Condition Monitoring and Asset Management, CM 2021,
19. Zippo, A., Pellicano, F., Iarriccio, G., **Time series analysis of arm and forearm measurement for functional electrical stimulation control**, (2021) 17th International Conference on Condition Monitoring and Asset Management, CM 2021.
20. Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F., **Efficiency and Durability of Spur Gears with Surface Coatings and Surface Texturing** (2021) Lecture Notes in Mechanical Engineering, pp. 285-291.
21. Barbieri, M., Iarriccio, G., Pellicano, F., Strozzi, M., Zippo, A., **Efficiency and Durability of DLC-Coated Gears**, (2021) IFTOMM - Mechanisms and Machine Science, 91, pp. 580-588. DOI: 10.1007/978-3-030-55807-9\_65
22. Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F., **Experimental study on large amplitude vibrations of a circular cylindrical shell subjected to thermal gradients**, (2020) Lecture Notes in Mechanical Engineering, pp. 1397-1404. DOI: 10.1007/978-3-030-41057-5\_113
23. Zippo, A., Pellicano, F., Iarriccio, G., Barbieri, M., **Vibrations of circular cylindrical shells under random excitation and thermal gradients**, (2020) Lecture Notes in Mechanical Engineering, pp. 1405-1414. DOI: 10.1007/978-3-030-41057-5\_114
24. Pellicano F., Zippo A., Iarriccio G., Barbieri M. (2020) **Experimental Study on Nonlinear Random Excitation**. In: Design Tools and Methods in Industrial Engineering. ADM 2019. Lecture Notes in Mechanical Engineering. Springer, Cham First Online 20 September 2019 DOI:10.1007/978-3-030-31154-4\_54

25. Zippo, A., Pellicano, F., Iarriccio, G., Barbieri, M., **Experimental investigation on spur gears with novel coatings and surface micro texturing** (2019) Proceedings of the 26th International Congress on Sound and Vibration, ICSV 2019.
26. Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F., **Efficiency and durability of spur gears with surface coatings and surface texturing** (2019), 2nd World Congress on Condition Monitoring (WCCM)
27. Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F., **Experimental durability test for condition monitoring of carburised spur gears** (2019) 16th International Conference on Condition Monitoring and Asset Management, CM 2019
28. Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F. **Experimental study on the nonlinear vibrations of a circular cylindrical shells: Effects of thermal gradients** (2019) Proceedings of the 26th International Congress on Sound and Vibration, ICSV 2019.
29. Zippo, A., Pellicano, F., Iarriccio, G., Franco, V., Francesco, C., **Identification of dynamic behaviour of forearm for active control of pathological tremor** (2019) Proceedings of the 26th International Congress on Sound and Vibration, ICSV 2019.
30. Zippo, A., Pellicano, F., Iarriccio, G., Valzania, F., Cavallieri, F. **Condition monitoring of parkinson pathological tremor for functional electrical stimulation control** (2019) 16th International Conference on Condition Monitoring and Asset Management, CM 2019.
31. Zippo, A., Pellicano, F., **Thermal effects on dynamics of circular cylindrical shell** (2018) 25th International Congress on Sound and Vibration 2018, ICSV 2018: Hiroshima Calling, 8, pp. 4616-4623.
32. Barbieri, M., De Felice, A., Pellicano, F., Sorrentino, S., Zippo, A., **Experimental identification of static and dynamic stiffness of polymeric vibration dampers** (2018) 25th International Congress on Sound and Vibration 2018, ICSV 2018: Hiroshima Calling, 5, pp. 3054-3060.
33. Zippo, A., Pellicano, F., Barbieri, M., Strozzi, M., **Vibration of functionally graded cylindrical shells** (2017) 24th International Congress on Sound and Vibration, ICSV 2017
34. Strozzi, M., Barbieri, M., Zippo, A., Pellicano, F., **Numerical study on nonlinear vibrations, energy exchange and resonant interactions in single walled carbon nanotubes** (2017) 24th International Congress on Sound and Vibration, ICSV 2017
35. Pellicano, F., Zippo, A., Barbieri, M., Strozzi, M., **Modal localization in vibrating circular cylindrical shells** (2017) 24th International Congress on Sound and Vibration, ICSV 2017.
36. Barbieri, M., De Felice, A., Pellicano, F., Sorrentino, S., Zippo, A. **A novel method for dynamic characterization of polymeric vibration dampers** (2017) 24th International Congress on Sound and Vibration, ICSV 2017
37. Strozzi, M., Barbieri, M., Pellicano, F., Zippo, A., **Pitting and stress analysis of gears: A numerical and experimental study** (2016) 13th International Conference on Condition Monitoring and Machinery Failure Prevention Technologies, CM 2016/MFPT 2016, .



38. Zippo, A., Barbieri, M., Pellicano, F., Strozzi, M., **Active vibration control of a composite plate** (2016) 13th International Conference on Condition Monitoring and Machinery Failure Prevention Technologies, CM 2016/MFPT 2016,
39. Masoumi, A., Barbieri, M., Pellicano, F., Zippo, A., Strozzi, M., **Dynamic imbalance of high speed planetary gears** (2016) 13th International Conference on Condition Monitoring and Machinery Failure Prevention Technologies, CM 2016/MFPT 2016,
40. Strozzi Matteo, Pellicano Francesco, Barbieri Marco, Zippo Antonio (2016). **Linear vibrations of multi-walled carbon nanotubes**. In: ICSV 2016 - 23rd International Congress on Sound and Vibration: From Ancient to Modern Acoustics. International Institute of Acoustics and Vibrations, ISBN: 9789609922623, Athenaeum Intercontinental Hotel, grc, 2016
41. Zippo Antonio, Pellicano Francesco, Barbieri Marco, Strozzi Matteo (2016). **Experimental investigation of dynamic behaviour of pre-compressed circular cylindrical shell**. In: Proceedings of the XXIV ICTAM. Montreal, Canada, 2016
42. Barbieri Marco, Zippo Antonio, Strozzi Matteo, Serafini Lorenzo, Pellicano Francesco, Bonori Giorgio (2015). **Dynamic modelling of gear pairs**. In: 22nd International Congress on Sound and Vibration, ICSV 2015. International Institute of Acoustics and Vibrations, ISBN: 9788888942483, Florence, Italy, 2015
43. Zippo Antonio, Pellicano Francesco, Barbieri Marco, Amabili Marco (2015). **Experimental and numerical study of MIMO active vibration control**. In: 22nd International Congress on Sound and Vibration, ICSV 2015. International Institute of Acoustics and Vibrations, ISBN: 9788888942483, Florence, Italy, 2015
44. Strozzi Matteo, Pellicano Francesco, Barbieri Marco, Zippo Antonio, Manevitch Leonid I. (2015). **Nonlinear oscillations of carbon nanotubes**. In: 22nd International Congress on Sound and Vibration ICSV 2015. ISBN: 9788888942483, Florence, Italy, July 12-16, 2015
45. Zippo Antonio, Pellicano Francesco, Barbieri Marco, Strozzi Matteo, **Experimental study on nonlinear dynamics of circular cylindrical shell** , Proceedings of the 18th International Conference on Composite Structures ICCS 2015, Lisbon, Portugal, June 15-18, 2015. ISSN: 0263-8223.
46. Zippo Antonio, Pellicano Francesco, Barbieri Marco, Strozzi Matteo, **PPF MIMO Control of a Composite Carbon Fiber Plate**, Proceedings of the 18th International Conference on Composite Structures ICCS 2015, Lisbon, Portugal, June 15-18, 2015. ISSN: 0263-8223.
47. Strozzi Matteo, Manevitch Leonid I., Pellicano Francesco, Barbieri Marco, Zippo Antonio (2015). **Beating phenomenon and energy localization in Single-Walled Carbon Nanotubes**. In: 18th International Conference on Composite Structures ICCS 2015, Lisbon, Portugal, June 15-18, 2015. ISSN: 0263-8223.
48. Zippo Antonio, Amabili Marco, Pellicano Francesco (2014). **Linear and nonlinear active vibration control of a sandwich carbon fiber plate**. In: Proceedings of 8th European Nonlinear Dynamics Conference ENOC 2014. ISBN: 9783200034334, Vienna, Austria, 2014
49. Pellicano Francesco, Zippo Antonio, Barbieri Marco (2014). **Nonlinear dynamics of axially loaded shells: experimental study**. In: Proceedings of 8th European

- Nonlinear Dynamics Conference ENOC 2014. ISBN: 9783200034334, Vienna, Austria, 2014
50. Zippo Antonio, Barbieri Marco, Pellicano Francesco (2013). **Circular Cylindrical Shells under combined axial loads: an experimental study**. In: Proceedings of the 4th International Conference on Nonlinear Dynamics ND-KhPI2013. ISBN: 9786176691006, Sevastopol, Ukraine, 2013
  51. Zippo Antonio, Amabili Marco, Pellicano Francesco (2013) - **Linear and nonlinear active vibration control of Carbon Fiber Sandwich Panel** - In: 4th Canadian Conference on Nonlinear Solid Mechanics: CanCNSM, ISBN: 9781550585339, Montreal, Canada, July 23-July 26, 2013
  52. Zippo Antonio, Pellicano Francesco, Barbieri Marco (2013) - **Vibration of preloaded circular cylindrical shells under axial excitation: experimental study** - In: 4th Canadian Conference on Nonlinear Solid Mechanics: CanCNSM, ISBN: 9781550585339, Montreal, Canada, July 23-July 26, 2013
  53. Pellicano Francesco, Strozzi Matteo, Zippo Antonio, Barbieri Marco, **Nonlinear Vibrations Of Circular Cylindrical Shells Under Axial Dynamic Loads**, Proceedings of the 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM2013), July 23-26, 2013, Montreal, Canada. ISBN: 9781550585339,
  54. Zippo Antonio, Pellicano Francesco, Barbieri Marco (2013) - **Experimental study on circular cylindrical shells under combined axial loads**. In: 7th Conference on Computational Fluid and Solid Mechanics MIT 2013. ISBN: 978-00-0045-794-9, Cambridge (MA), USA, June 12-14, 2013
  55. Zippo Antonio, Strozzi Matteo, Manevitch Leonid I., Pellicano Francesco, Barbieri Marco (2013). **Nonlinear vibrations and energy conservation of Single-Walled Carbon Nanotubes**. In: 7th Conference on Computational Fluid and Solid Mechanics MIT 2013. ISBN: 978-00-0045-794-9, Cambridge (MA), USA, June 12-14, 2013
  56. Strozzi Matteo, Pellicano Francesco, Zippo Antonio (2012). **Nonlinear vibrations of functionally graded cylindrical shells: Effect of the geometry**. In: ASME 2012 International Design Engineering Technical Conferences IDETC. ISBN: 978-07-9184-504-2, Chicago (IL), USA, August 12-15, 2012
  57. Zippo Antonio, Barbieri Marco, Strozzi Matteo, Errede Vito, Pellicano Francesco (2012). **Experimental Study on Prestressed Circular Cylindrical Shell**. In: ASME 2012 International Design Engineering Technical Conferences IDETC. ISBN: 9780791845004, Chicago (IL), USA, August 12-15, 2012
  58. Zippo Antonio, Barbieri Marco, Strozzi Matteo, Errede Vito, Pellicano Francesco (2012). **Linear and nonlinear dynamics of a circular cylindrical shell under static and periodic axial load**. In: 19th International Congress on Sound and Vibration ICSV 2012. ISBN: 978-16-2276-465-5, Vilnius, Lithuania, July 8-12, 2012
  59. Barbieri Marco, Zippo Antonio, Pellicano Francesco (2011). **Adaptive Grid-Size Modelling of Helical Gear Pairs**. In: Proceedings of the IFToMM - The 13th World Congress in Mechanism and Machine Science. p. 1-5, Guanajuato: IFToMM - International Federation for the Promotion of Mechanism and Machine Science, ISBN: 9786074411317, Guanajuato, 19-23/06/2011
  60. Pellicano Francesco, Strozzi Matteo, Zippo Antonio (2011). **Effect of the geometry on the nonlinear vibrations of functionally graded cylindrical shells**. In: 6th

Conference on Computational Fluid and Solid Mechanics MIT 2011. ISBN: 978-00-0045-794-9, Cambridge (MA), USA, July 15-17, 2011

61. Strozzi Matteo, Pellicano Francesco, Zippo Antonio (2011). **Nonlinear vibrations of functionally graded circular cylindrical shells**. In: 18th International Congress on Sound and Vibration ICSV 2011. ISBN: 978-16-1839-259-6, Rio de Janeiro, Brazil, July 10-14, 2011

#### PUBLICATIONS ON PROCEEDINGS OF NATIONAL CONFERENCES

1. Zippo, A., Pellicano, F., Iarriccio, G., **Microcontroller Design for Active Vibration Control**, (2022) AIMETA 2022
2. Pellicano, F., Zippo, A., Iarriccio, G., Barbieri, M., **Experimental Study on Nonlinear Random Excitation**, Proceedings of the International Conference on Design Tools and Methods in Industrial Engineering, ADM 2019 , pp 637-648
3. Zippo, A., Pellicano, F., Barbieri, M., Strozzi, M., Masoumi, A., **Experimental identification of FGM shell properties** (2017) AIMETA 2017 - Proceedings of the 23rd Conference of the Italian Association of Theoretical and Applied Mechanics, 4, pp. 60-70.
4. Strozzi Matteo, Barbieri Marco, Zippo Antonio, Pellicano Francesco (2015). **Dynamics and Stability of Carbon Nanotubes**. In: XXII Congresso dell'Associazione Italiana di Meccanica Teorica e Applicata AIMETA 2015. ISBN: 978-88-9775-252-3, Genova, Italy, September 14-17, 2015
5. Antonio Zippo, Marco Barbieri, Francesco Pellicano (2011). **3D Nonlinear Finite Element Modeling of Helical Gears**. In: Atti del XX Congresso dell'Associazione Italiana di Meccanica Teorica e Applicata. vol. 1, p. 1-8, BOLOGNA: AIMETA 2011, ISBN: 9788890634017, Bologna, 12-15/09/2011

#### PARTICIPATION IN INTERNATIONAL CONFERENCES as speaker

1. IMECE2023, ASME International Mechanical Engineering Congress and Exposition
2. ISVCS13, 13th International Symposium on Vibrations of Continuous Systems Pomeroy, Kananaskis Mountain Lodge, Alberta, Canada, July 30th - August 4th, 2023
3. 19th International Conference on Condition Monitoring and Asset Management –CM2023
4. NODYCON2023 - Third International Nonlinear Dynamics Conference
5. 28th International Congress on Sound and Vibration, ICSV 2022
6. ICONSOM 2022 - The International Conference of Nonlinear solid Mechanics
7. 10th European Nonlinear Dynamics Conference (ENOC 2020) 2022
8. 18th International Conference on Condition Monitoring and Asset Management –CM2022
9. 17th International Conference on Condition Monitoring and Asset Management –CM2021
10. 26th International Congress on Sound and Vibration, ICSV 2019.
11. 16th International Conference on Condition Monitoring and Asset Management, CM2019
12. 24th International Congress on Sound and Vibration, ICSV 2017
13. 24th International Congress of Theoretical and Applied Mechanics, ICTAM2016. August 21-26, 2016, Montreal, Canada. (presentazione orale)
14. 23rd International Congress on Sound and Vibration: From Ancient to Modern Acoustic, ICSV23, 10-14 July 2016, Athens, Greece

15. 22nd International Congress on Sound & Vibration, ICSV22, July 12-16, 2015, Firenze, Italia (presentazione orale).
16. 18th International Conference on Composite Structures ICCS 2015, Lisbon, Portugal, June 15-18, 2015.
17. 19th International Congress on Sound & Vibration, ICSV19, July 8-12, 2012, Vilnius, Lithuania (presentazione orale).
18. European Nonlinear Oscillations Conference (ENOC) 2014, July 6-11, 2014, Vienna, Austria (presentazione orale).
19. 4th Canadian Conference on Nonlinear Solid Mechanics: CanCNSM2013, Montreal, Canada, July 23-July 26, 2013 (tre presentazioni orali)
20. 7th Conference on Computational Fluid and Solid Mechanics MIT 2013. Cambridge (MA), USA, June 12-14, 2013 (due presentazioni orali)
21. ASME 2012 International Design Engineering Technical Conferences IDETC. Chicago (IL), USA, August 12-15, 2012 (due presentazioni orali)
22. 6th Conference on Computational Fluid and Solid Mechanics MIT 2011. Cambridge (MA), USA, July 15-17, 2011 (presentazione orale).
23. 18th International Congress on Sound and Vibration ICSV 2011. Rio de Janeiro, Brazil, July 10-14, 2011 (presentazione orale).

#### **PARTICIPATION IN NATIONAL CONFERENCES as speaker**

1. AIMETA 2022 XXV Conference - The Italian Association of Theoretical and Applied Mechanics, Palermo, Italy, 4-8 September 2022
2. AIMETA 2019 XXIV Conference The Italian Association of Theoretical and Applied Mechanics Rome, Italy, 15-19 September 2019
3. XX Congresso dell'Associazione Italiana di Meccanica Teorica e Applicata – AIMETA, 12-15 settembre 2011, Bologna (presentazione orale).

#### **EDITORIAL ACTIVITY**

Member of Editorial Board for section 'Engineering' of Mathematical and Computational Applications - MDPI

Reviewer for the following journals: Journal of Sound and Vibration, Composite Structures, Journal of Mechanical Engineering, Journal of Nonlinear Dynamics

#### **COLLABORATIONS FOR RESEARCH ACTIVITIES**

- Loughborough University, Loughborough, UK - Prof. Andrew Watson
- McGill University, Montreal, Canada – Prof. M. Amabili
- Cranfield University, Cranfield, UK – Prof. L. Gelman
- National Technical University, Kharkov, Ukraine - Prof. Tatyana Shmatko
- University of Waikato - Prof. Sinniah Ilanko

## BIBLIOMETRIC INDEXES (27 Jun 2024)

- H-index: 12
- Citazioni totali: 354
- Peer-review journal: 19

## Session Organizer in international congresses

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- Topic Session Organizer of IMECE 2024 Track 7 Dynamics, Vibration, and Control **07-23: Powertrain Dynamics for Electric Vehicle Propulsion**
- **Member of the Scientific International Committee** of British Institute of Non-Destructive Testing (BINDT) for The International Conference on Condition Monitoring and Asset Management (CM) since 2021 and organiser of a structured session on **Signal processing and Modeling of Complex Systems**
- **Special Session "Modeling and experiments of complex continuous systems"** in DSTA 2019 - 15th Dynamical Systems Theory and Applications, Lodz, Poland
- **Special Session "Signal Processing and Modeling of Complex Systems"** in WCCM 2019 - 2nd World Congress of Condition Monitoring, Singapore

## Professional distinctions and memberships

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- **"National Scientific Qualification as Full Professor"** [29/11/2023] SETTORE CONCORSUALE 09/A2 MECHANISM AND MACHINE THEORY - FASCIA: I
- **"National Scientific Qualification as Associate Professor"** [31/05/2021] SETTORE CONCORSUALE 09/A2 MECHANISM AND MACHINE THEORY - FASCIA: II
- **Member of ASME**
- **Member of PhD School Board** in *Industrial and Environmental Engineering of Department of Engineering "Enzo Ferrari"*
- **"National Academic Qualification as Associate Professor"** [31/05/2021] SETTORE CONCORSUALE 09/A2 MECHANISM AND MACHINE THEORY - FASCIA: II
- **Certificate of Merit** for having distinguished himself in the field of national and international research conferred by the University of Modena and Reggio Emilia on 16 December 2019 by the Rector Prof. Carlo Adolfo Porro.
- **Certificate of Merit** for having distinguished himself in the field of national and international research conferred by the University of Modena and Reggio Emilia on March 21, 2016 by the Rector Prof. Angelo Oreste Andrisano
- **Best Paper**  
Awarded by 2nd World Congress on Condition Monitoring (WCCM) to Iarriccio, G., Zippo, A., Barbieri, M., Pellicano, F., Efficiency and durability of spur gears with surface coatings and surface texturing (2019), 2nd World Congress on Condition Monitoring (WCCM) 2nd-5th December 2019, Singapore
- **Sir James Lighthill Best Student Paper Award (2015)**  
Awarded by the 22nd International Congress on Sound and Vibration ICSV 2015, for "Zippo Antonio, Pellicano Francesco, Barbieri Marco, Amabili Marco (2015). Experimental and numerical study of MIMO active vibration control. In: 22nd International Congress on Sound and

Vibration, ICSV 2015. International Institute of Acoustics and Vibrations, ISBN: 9788888942483, Florence, Italy, 2015"

## Fields of interest

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### **Activities: theory, modeling and experimental research**

- Powertrain: modeling and experimental testing, simulation of the gear cutting process, modeling of nurbs, curves and surfaces, digital twin, predictive maintenance, and condition monitoring.
- Structural and vibrational problems: numerical and experimental techniques.
- Nonlinear dynamics, stability and chaos of mechanical structures and systems.
- Active and passive vibration control.
- Soft-materials, Meta-materials, smart-materials, innovative material and compliant structures for NVH application.
- Non-Newtonian Fluid-Structure Interaction: experimental tests, data-driven modeling, and nonlinear time series data analysis.
- Bio-engineering: modeling, simulation and experimental EMG measurement of upper limb for Parkinson tremor diagnostic, prognostic, and control; neural network speech feature extraction.

## Industrial research projects

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- 2024 - Eurosets srl: dynamic performances on medical device for airborne equipment
- 2023 - E-shock srl: Back-to-back calibration of prototypal accelerometer
- 2023 - Eurosets srl: Structural Optimization for dynamic performances on medical device for airborne equipment
- 2022 - Eurosets srl: Environmental testing on medical device for airborne equipment
- 2022 - Vimec srl: Experimental measurement and data analysis for elevator worm gear instabilities
- 2021 - DTM srl: Experimental modal analysis for satellite PTA

## Participation in industrial research projects

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- 2019 - DTM srl: Experiment cell dust test - for ISS
- 2019 - DTM s.r.l. Vibration tests for relief valve Exomars
- 2016 - DTM s.r.l.: "Vibration tests on heat exchangers for space use".
- 2014-2015, Comer Industries S.p.A.: "Model of a gearbox for load and stress analysis".
- 2013, Agusta-Westland S.p.A.: "Skewed Roller Brake STB applied research project".
- 2012, M&B Engineering s.r.l., "Improvement of the performance of tyre balancing machines".
- 2011, CGS Carlo Gavazzi Space, then Compagnia Generale per lo Spazio – "Structural solutions for a rapid pointing telescope" (project carried out in collaboration with ESA).
- 2010 - 2011, CNH – Case New Holland: Study and definition of virtual simulation models of the static and dynamic behavior of gear wheels under load and significant parts of transmissions".

## Funded projects

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- **FAR2022 - Identification, modelling and analysis of nonlinear EMG signals of pathological tremor** - Fondo di Ateneo per la Ricerca 2022 per il finanziamento di piani di sviluppo dipartimentale nell'ambito della ricerca. 27/07/2022 10.000€
- Finanziamento da CONSORZIO FUTURO IN RICERCA per ricerca su **“MODELLAZIONE E MISURE SPERIMENTALI DI SISTEMI COMPLESSI NON LINEARI FINALIZZATI AL CONTROLLO ATTIVO DEL TREMORE ESSENZIALE E PARKINSONIANO”** 01/05/2022 30870€
- Progetto **“Scuola internazionale di alta formazione in NVH per l'Industria 4.0 Higher Education school in NVH for Industry 4.0”** dal 22/11/2021 al 31/12/2023 13750 €
- **Finanziamento individuale per la ricerca di base** Individual funding of 3,000 euros for basic research activities REFERRED to IN ARTICLE 1, PARAGRAPHS 295 AND FOLLOWING, OF LAW NO. 232 OF 11 DECEMBER 2016

## Personal skills

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### □ Languages

Italian | Native  
English | C1 level

### □ IoT skills

Programming Languages: Mathematica, Matlab, Fortran, C, Python, Visual Basic

Web technologies: Html, php

Software :MSC Marc Mentat, MSC Nastran, MSC Adams, Hypermesh, Pro Engineer, LabView, CAD, Microsoft Office Suite, Adobe Suite, OpenOffice Suite, Labview, dSpace, Calyx

Database: Mysql

Operative Systems: Dos, Windows, Linux/Unix, Mac OS

### □ Technical skills

Experience in scientific laboratory activities such as equipment calibration, electronic and mechanical setup of experiments, measurements and monitoring, FEM analysis, Multi-body analysis, modal analysis, structural analysis, environmental vibration test with or without climatic chamber..

### □ Web Engineering [2002 – present]

Designs, develops, and creates static and dynamic websites with web 2.0 technology, develops mobile applications for iOS and Android.

Modena, 27 June 2024

