Curriculum Vitae

First Name: **Valentina**
Last Name: **Zega**
Date of birth:
Nationality: **Italian**
Sex: **Female**

E-mail: **valentina.zega@polimi.it**
Web-site: **zega.faculty.polimi.it**

Current position: **Assistant Professor (RTDb) – Politecnico di Milano**
'***Modellazione e simulazione multi-fisica e nonlineare di microsistemi, materiali smart, metamateriali***'

EDUCATION

Nov. 2013 – Febr. 2017: **PhD in Structural, Seismic and Geotechnical Engineering** (Degree: cum laude)
Institution: Politecnico di Milano, Milan, Italy + STMicroelectronics
Supervisors: prof. Alberto Corigliano, prof. Claudia Comi and prof. David A. Horsley
Title: MEMS sensors for the measurement of angular velocity: mechanical and structural issues

Oct. 2010 – Apr. 2013: **Master in Mathematical Engineering** (Degree: 110/110)
Institution: Politecnico di Milano, Milan, Italy
Supervisors: prof. Alberto Corigliano, prof. Claudia Comi
Title: Torsional resonator for microsystems: modelling, experimentation, applications

Sept. 2007 – July 2010: **Bachelor in Mathematical Engineering** (Degree: 110/110)
Institution: Politecnico di Milano, Milan, Italy
Supervisor: prof. Paolo Biscari
Title: Instability of an half space under compression

SCHOLARSHIPS

Nov. 2013 - Nov. 2016: **PhD scholarship** by STMicroelectronics

AWARDS

Febr. 2018 **Arnaldo Rancati award** from Istituto Lombardo Accademia di Scienze e Lettere, Milano
Award for an unpublished work to the advantage of the aeronautics or technical industry in general

Oct. 2004 **Pagella d'oro** from Carifermo, Cassa di risparmio di Fermo s.p.a.
Award for the best high-school students (Liceo Scientifico L. Einaudi – Porto Sant'Elpidio)

ACADEMIC EXPERIENCE

Since June 2021: **Assistant Professor (RTDb) – ICAR08 Scienza delle costruzioni**
Institution: Politecnico di Milano
- Numerical modelling, optimization and experimental validation of MEMS devices
- Numerical modelling of nonlinear phenomena in MEMS
- Mechanical design and numerical modelling of metamaterials at the micro and macro scales

Feb. 2019 – May 2021: **Assistant Professor (RTDa) – ICAR08 Scienza delle costruzioni**
Institution: Politecnico di Milano
- Numerical modelling, optimization and experimental validation of MEMS resonators
- Numerical modelling of nonlinear phenomena in MEMS
- Mechanical design and numerical modelling of metamaterials at the micro and macro scales

June 2018 – Nov. 2018: **PostDoctoral Researcher**

Institution: Eindhoven University of Technology (TU/e)

Supervisors: prof. M.G.D. Geers, prof. V.G. Kouznetsova

- Numerical modelling and experimental validation of nonlinear locally resonant metamaterials
- Design of a locally resonant metamaterial exhibiting a subharmonic bandgap

Feb. 2017 – May 2018: **PostDoctoral Researcher**

['Assegno di ricerca Legge 240' from Nov. 16th 2016 to June 1st 2018]

Institution: Politecnico di Milano, Milan, Italy + STMicroelectronics

Supervisors: prof. A. Corigliano, prof. C. Comi, prof. A. Frangi

- Modelling and design of Frequency Modulated (FM) Gyroscopes and MEMS resonators
- Modelling and design of new metamaterials (auxetic structures and phononic crystals)
- Modelling, design and experimental tests of 3D printed and wet-metallized sensors (*z*-axis and three-axial accelerometers)

Oct. 2015 – Dec. 2015: **Visiting researcher at UCDavis**

Institution: University of California Davis (UCDavis, CA)

Supervisor: prof. D.A. Horsley

- Mechanical design of differential frequency modulated gyroscopes
- Finite Elements analysis and mechanical modelling of multi-physics problems

Febr. 2014 – May 2014: **Visiting researcher at UCDavis**

Institution: University of California Davis (UCDavis, CA)

Supervisor: prof. D.A. Horsley

- Parametric amplification in MEMS disk resonant gyroscopes
- Mathematical nonlinear modelling, Finite Elements analysis and testing

TEACHING EXPERIENCE

Since Sept. 2019: **Teaching**

Institution: Politecnico di Milano, Milan, Italy

- Computational Mechanics – Master in Environmental and Land Planning Engineering/ Master in Mathematical Engineering (5 CFU)
  Academic year: 2019/2020 – 2020/2021

Since Oct. 2014: **Teaching assistant**

Institution: Politecnico di Milano, Milan, Italy

- Structural Mechanics – Bachelor in Environmental and Land Planning Engineering (prof. Comi)
  Academic year: 2017/2018 – 2018/2019
- Structural Mechanics – Mathematical Engineering (prof. Frangi)
  Academic year: 2017/2018 – 2018/2019 – 2019/2020 – 2020/2021
- Structural Mechanics – Mathematical Engineering (prof. Corigliano)
  Academic years: 2014/2015 - 2015/2016 – 2016/2017
- Structural Mechanics – Bachelor in Building Engineering (prof. Frangi)
  Academic years: 2016/2017
- Statics of Structures – Bachelor in Building Engineering (prof. Frangi)
  Academic years: 2014/2015 – 2017/2018
- Microelectromechanical Systems – Master in Materials Engineering and Nanotechnology (prof. Corigliano)
  Academic years: 2014/2015 – 2015/2016 – 2017/2018 – 2018/2019
- Computational Mechanics and Inelastic Structural Analysis – Master in Civil Engineering (prof. Corigliano)
  Academic years: 2018/2019
- Scientific and Technical Communication – Master in Civil Engineering (prof. Comi)
  Academic years: 2018/2019

Since Jan. 2015: **Co-Supervisor of Master Theses**

Institution: Politecnico di Milano, Milan, Italy

- Master thesis of Nystha Baishya: '*Auxetic structures for microsystems: study, modelling and 3D printing*' (December 2015) - Materials Engineering and Nanotechnology
- Master thesis of Alessandro Garatti and Milena Doti: '*Dynamic nonlinear behavior of microstructures: modelling and experimental validation*' (July 2016) – Civil Engineering
- Master thesis of Andrea Castiglioni: '*Design, fabrication and modelling of three-dimensional microlattice structures*' (April 2017) - Civil Engineering
- Master thesis of Jacopo Carraro: '*Multi-physics modelling and design of a new piezoelectric micro-gyroscope*' (April 2017) - Materials Engineering and Nanotechnology
- Master thesis of Alessandro Stoppato: '*Design, fabrication and analysis of a 3D-printed triaxial accelerometer'* (April 2018) – Materials Engineering and Nanotechnology
- Master thesis of Andrea Guercilena: '*Numerical modelling of micro-resonators'* (April 2018) – Civil Engineering
- Master thesis of Ruixue Zhao: '*3D Printed metamaterials for vibration isolation*' (April 2019) – Materials Engineering and Nanotechnology
- Master thesis of Luca Martinelli: '*3D-Printed titanium Accelerometers*' (December 2020) – double degree Material Engineering and Nanotechnology and Mechanical Engineering
- Master thesis of Marco Antonacci: '*Phononic crystal based lenses for focusing and energy harvesting*' (December 2020) - Material Engineering and Nanotechnology

Since Oct. 2016: **Co-Supervisor of PhD students**

- Jing Zhang: visiting PhD student (2016/2017)
  Institution: Nanjing University of Science and Technology, Nanjing, China
  Topic: MEMS resonant accelerometers: nonlinear dynamics under varying temperature conditions
- Zhichao Yao: visiting PhD student (2018/2020)
  Institution: Nanjing University of Science and Technology, Nanjing, China
  Topic: Phononic crystals in MEMS devices for vibration insulation
- Giorgio Gobat (2018/2021)
  Institution: Politecnico di Milano
  Topic: Numerical modelling of nonlinear phenomena in MEMS devices
- Ali Hosseinkhani: visiting (online for Covid pandemia) PhD student (2021)
  Institution: Iran University of Science and Technology, School of Railway Engineering, Iran
  Topic: numerical modelling and optimization of metamaterials

Since Oct. 2014: **Tutor**

Camplus College Città Studi and Turro, Milan, Italy

- Tutoring service for the students of the Camplus College

INDUSTRIAL EXPERIENCE

March 2017 – Apr. 2017: **Scientific consulting**

Find your doctor, Consorzio per il trasferimento tecnologico C2T, Milan, Italy

- Scientific consulting for a company

June 2013 – Oct. 2013: **Internship at STMicroelectronics**

STMicroelectronics, Cornaredo, Italy

- Mechanical design of a biaxial Amplitude Modulated gyroscope for consumer application

LANGUAGES

Mother tongue(s) Italian

Other languages English

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
C1	C1	C1	C1	C1
TOEFL - IBT				

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

PERSONAL SKILLS

Communication skills

- communication skills gained through my experience as teaching assistant at Politecnico di Milano, as tutor at Camplus College (university residence), as presenter in international conferences and as children entertainer (Piccoli Sogni, Italy)
- team working skills gained through my PhD, postdoc and assistant professor positions, my internship at STMicroelectronics, my experience as scientific consulting for a company and as dancer in a chorus
- good intercultural skills gained through my PhD, my periods abroad and several travels

Organizational/managerial skills

- project manager skills gained through my experience as co-supervisors of master and PhD theses and through my activity in the interdepartmental laboratory MEMS&3D Lab at Politecnico di Milano
- organisational skills gained through my experience as secretary assistant at Politecnico di Milano (150 hours collaborations) and events organizer (Piccoli Sogni, Italy)

Job related skills

- finite elements simulations for mechanical/multi-physics problems, both in statics and dynamics
- mathematical-physical modelling, both in linear and nonlinear regimes
- topology optimization for the design of metamaterials (e.g. auxetic structures)
- genetic algorithms (i.e. CMA-ES) for the shape optimization and mechanical design of MEMS (e.g. MEMS resonators) and metamaterials
- design, simulation and experimental testing of MEMS accelerometers, gyroscopes and resonators
- design, simulation and experimental testing of linear and nonlinear metamaterials

Technical skills

- Matlab, Mathematica, ANSYS, COMSOLMultiphysics, Illustrator, Word, PowerPoint, Excel
- CAD software: Solidworks, Klayout, Cadence
- Programming languages: C++, Fortran, CUDA, OpenMP, MPI
- Operating systems: Windows and Linux

PUBLICATIONS

Co-author of 28 publications in peer-reviewed journals of national and international levels, of 27 contributions in international conferences and of 4 patents. The current value of the h-index is 12/12 (wd. Scopus/Google Scholar). The current citations number is 429/526 (wd. Scopus/Google Scholar).

PhD thesis

[0] **V. Zega** *'MEMS sensors for the measurement of the angular velocity: mechanical and structural issues'*, 2017.

Publications in peer reviewed journals

[1] **V. Zega**, C. Comi, A. Corigliano, C. Valzasina *'Integrated structure for a resonant micro-gyroscope and accelerometer'* Frattura e integrità strutturale, 29 (2014) 334-342

[2] Caspani, C. Comi, A. Corigliano, G. Langfelder, **V. Zega** and S. Zerbini '*A differential resonant micro accelerometer for out-of-plane measuremens'* Procedia Engineering, 87 (2014) 640-643

[3] Caspani, C. Comi, A. Corigliano, G. Langfelder, **V. Zega** and S. Zerbini '*Dynamic nonlinear behaviour of torsional resonators in MEMS'* Journal of Micromechanics and Microengineering, 24 (2014) 095025

[4] S. H. Nitzan, **V. Zega**, M. Li, C. H. Ahn, A. Corigliano, T. W. Kenny, D. A. Horsley '*Self-induced parametric amplification arising from nonlinear elastic coupling in a micromechanical resonating disk gyroscope'* Scientific Reports 5 (2015) DOI:10.1038/srep09036

[5] **V. Zega**, S. H. Nitzan, M. Li,C. H. Ahn,E. Ng, V. Hong,Y. Yang T. Kenny, A. Corigliano, and D. A. Horsley '*Predicting the closed-loop stability and oscillation amplitude of nonlinear parametrically amplified oscillators'* Applied Physics Letters 106, 233111 (2015) doi: 10.1063/1.4922533

[6] C. Comi, A. Corigliano, M. Doti, A. Garatti, G. Langfelder, **V. Zega '***Torsional microresonator in the nonlinear regime: experimental, numerical and analytical characterization'* Procedia Engineering, 168 (2016), 933-936

[7] C. Comi, A. Corigliano, G. Langfelder, **V. Zega**, S. Zerbini '*Sensitivity and temperature behaviour of a novel z-axis differential resonant micro accelerometer'* Journal of Micromechanics and Microengineering 26 (2016) 1-11

[8] C. Comi, A. Corigliano, **V. Zega** and S. Zerbini '*Non linear response and optimization of a new z-axis resonant micro-accelerometer'* Mechatronics 40 (2016) 235-243

[9] M. Bruggi, **V. Zega** and A. Corigliano '*Synthesis of auxetic structures using optimization of compliant mechanisms and a micropolar material model'* Structural and Multidisciplinary Optimization 55 (2017) 1-12

[10] **V. Zega**, C. Credi, R. Bernasconi, G. Langfelder, L. Magagnin, M. Levi and A. Corigliano '*The first 3D-printed z-axis accelerometers with differential capacitive sensing'* IEEE Sensors Journal 18 (2018) 53- 60

[11] P. Minotti, S. Dellea, G. Mussi, A. Bonfanti, S. Facchinetti, A. Tocchio, **V. Zega**, C. Comi, A. Lacaita, G. Langfelder '*High scale-factor stability frequency-modulated MEMS gyroscope: 3-axis sensor and integrated electronics design*' IEEE Transaction on Industrial Electronics, 65(6) (2018) 5040-5050

[12] L. D'Alessandro, **V. Zega**, R. Ardito, A. Corigliano '*3D auxetic single material periodic structure with ultra-wide tunable bandgap*' Scientific Reports 8:2262 (2018)

[13] **V. Zega**, C. Comi, P. Minotti, G. Langfelder, L. Falorni, A. Corigliano '*A new MEMS three-axial frequency-modulated (FM) gyroscope: a mechanical perspective*' European Journal of Mechanics/A Solids, 70 (2018) 203-212.

[14] J. Zhang, Y. Wang, **V. Zega**, Y. Su, A. Corigliano *'Nonlinear dynamics under varying temperature conditions of the resonating beams of a differential resonant accelerometer'* Journal of Micromechanics and Microengineering, 28 (2018) 075004.

[15] **V. Zega**, A. Frangi, A. Guercilena, G. Gattere '*Analysis of frequency stability and thermoelastic effects for slotted tuning fork MEMS resonators*' MDPI Sensors, 18(7) (2018) 2157.

[16] **V. Zega**, G. Langfelder, L.G. Falorni, C. Comi '*Hardening, softening and linear behavior of elastic beams in MEMS: an analytical approach*' J. Microelectromech. Syst., 28(2) (2019) 189-198.

[17] **V. Zega**, A. Nastro, M. Ferrari, R. Ardito, V. Ferrari, A. Corigliano '*Design, fabrication and experimental validation of a MEMS periodic auxetic structure*' Smart Mater. Struct. 28 (2019) 095011.

[18] **V. Zega**, M. Invernizzi, R. Bernasconi, F. Cuneo, G. Langfelder, L. Magagnin, M. Levi, A. Corigliano '*The first 3D-printed and wet-metallized three-axis accelerometer with differential capacitive sensing*' IEEE Sensors Journal, 19 (20) (2019) 9131-9138.

[19] G. Mussi, M. Bestetti, **V. Zega**, A. Frangi, G. Gattere, G. Langfelder '*An Outlook on potentialities and limits in using epitaxial polysilicon for MEMS realt-time clocks*' IEEE Transaction on Industrial Electronics, 67(8) (2020) 6996-7004.

[20] C. Comi, **V. Zega**, A. Corigliano, '*Non-linear mechanics in resonant inertial micro sensors'* Int. J. Nonlinear Mech. 120 (2020) 103386.

[21] L. Gaffuri Pagani, P. Carulli, **V. Zega**, R. Suriano, R. Bernasconi, A. Frangi, M. Levi, L. Magagnin, G. Langfelder '*The First Three-Dimensional Printed and Wet-Metallized Coriolis Mass Flowmeter*' IEEE Sensors Lett. 4 (6) (2020) 2500604.

[22] Z. Yao, R. Zhao, **V. Zega**, A. Corigliano, '*A metaplate for complete 3D vibration isolation*', European J. Solid Mech. A/Solids, 84, (2020) 104016.

[23] **V. Zega**, P. B. Silva, M. G. D. Geers, V. G. Kouznetsova '*Experimental proof of emergent subharmonic attenuation zones in a nonlinear locally resonant metamaterial*' Scientific Reports, 10 (1), (2020) 12041.

[24] Z. Yao, **V. Zega**, Y. Su, J. Ren, J. Zhang, A. Corigliano '*Design, fabrication and experimental validation of a metaplate for vibration isolation in MEMS*' J. Microelectromech. Syst., 29(5), (2020), 1401-1410.

[25] **V. Zega**, G. Gattere, S. Koppaka, A. Alter, G.D. Vukasin, A. Frangi, T.W. Kenny '*Numerical modelling of Non-Linearities in MEMS resonators*' J. Microelectromech. Syst., 26(6), (2020), 1443-1453.

[26] L. Pertoldi, **V. Zega**, C. Comi, R. Osellame '*Dynamic mechanical characterization of two-photon-polymerized SZ2080 photoresist*' J. Applied Physics, 128, (2020), 175102.

[27] **V. Zega**, L. Martinelli, R. Casati, E. Zappa, G. Langfelder, A. Cigada, A. Corigliano '*A 3D Printed Ti6Al4V Alloy Uniaxial Capacitive Accelerometer'* IEEE Sensors Journal, 21 (18), (2021) 19640–19646.

[28] G. Gobat, **V. Zega**, P. Fedeli, L. Guerinoni, C. Touzé, A. Frangi '*Reduced order modelling and experimental validation of a MEMS gyroscope test-structure exhibiting 1:2 internal resonance'* Scientific Reports, 11 (1), (2021), 16390.

Publications in non-peer reviewed journals

[1] P. B. Silva, T. van Nuland, T. S. van Loon, **V. Zega**, M. J. Leamy, M. G. D. Geers, V. G. Kouznetsova '*Acoustic metamaterials: metamaterials for wave control and manipulation by exploring nonlinearities*' in Innovative Materials, 4 (2018) 30-35.

International conferences contributions (presented)

[1] C. Comi, A. Corigliano, M. Doti, A. Garatti, G. Langfelder, **V. Zega '***Torsional microresonator in the nonlinear regime: experimental, numerical and analytical characterization'* Eurosensors16, Budapest, Hungary, September 4-7, 2016

[2] C. Credi, **V. Zega**, R. Bernasconi, G. Langfelder, A. Cigada, L. Magagnin, M. Levi, A. Corigliano '*Design, fabrication and testing of the first 3D-printed and wet metallized z-axis accelerometer'* Proceedings, 1, 614, doi: 10.3390/proceedings1040614 (2017) 1-5

[3] **V. Zega**, P. Minotti, G. Mussi, A. Tocchio, L. Falorni, S. Facchinetti, A. Bonfanti, A.L. Lacaita, C. Comi, G. Langfelder, A. Corigliano '*The first frequency-modulated (FM) pitch gyroscope'* Proceedings, 1, 393, doi: 10.3390/proceedings1040393 (2017) 1-5

[4] **V. Zega**, M. Bruggi, A. Corigliano '*Optimization of auxetic structures'* IV ECCOMAS young investigator conference, Milan, Italy, September 13-15, 2017

[5] **V. Zega**, C. Comi, P. Fedeli, A. Frangi, A. Corigliano, P. Minotti, G. Langfelder, L. Falorni, A. Tocchio '*A dual-mass frequency-modulated (FM) pitch gyroscope: mechanical design and modelling*' Inertial '18, Lake Como, Italy, March 26-29, 2018

[6] **V. Zega**, A. Frangi, A. Guercilena, G. Gattere '*Numerical modelling of MEMS resonators*' ESMC 2018, Bologna, Italy, July 2-6, 2018

[7] **V. Zega**, C. Comi, G. Langfelder, L. Falorni '*A strategy to widen the linear range of elastic micro-springs'* ESMC 2018, Bologna, Italy, July 2-6, 2018

[8] **V. Zega**, P. B. Silva, V. Kouznetsova, M. G. D. Geers '*Towards an emergent metamaterial design'* Engineering Mechanics (EM) Symposium 2018, Arnhem, the Netherlands, October 23-24, 2018

[9] **V. Zega**, A. Frangi, G. Gattere '*Numerical modelling of nonlinearities in MEMS resonators for real-time clocks*' IcoNsoM 2019, Rome, Italy, June 16-19, 2019

[10] **V. Zega**, P. B. Silva, V. G. Kouznetsova, M. G. D. Geers '*Nonlinear locally resonant metamaterials with emergent attenuation zone: a new design*' IcoNsoM 2019, Rome, Italy, June 16-19, 2019

[11] **V. Zega**, C. Comi, E. Bordiga, G. Langfelder, L. Falorni, A. Corigliano '*Towards 3-axis FM MEMS gyroscopes: mechanical design and experimental validation*' Transducers 2019 – Eurosensors XXXIII, Berlin, Germany, June 23-27, 2019

[12] **V. Zega**, A. Frangi, G. Gattere, '*Nonlinear Dynamics of MEMS resonators: numerical modelling and experiments*' IEEE Sensors 2019, Montreal, Canada, October 27-30, 2019.

[13] **V. Zega**, A. Opreni, G. Mussi, H.-K. Kwon, G. Vukasin, G. Gattere, G. Langfelder, A. Frangi, T. W. Kenny, '*Thermal stability of DETF MEMS resonators: numerical modelling and experimental validation*' Proc. IEEE MEMS2020, Vancouver, Canada, January 23-28, 2020, 9056338,1207-1210.

[14] Z. Yao, **V. Zega**, Y. Su, A. Corigliano, '*A metaplate in MEMS for innovative applications: vibration isolation and tunable mechanical filters*' IEEE SENSORS 2020, online conference, October 25-28, 2020.

Further international conferences contributions

[1] C. Comi, A. Corigliano, **V. Zega** and S. Zerbini '*Optimal design and nonlinearities in a z-axis resonant accelerometer'* Eurosime 2015, Budapest, Hungary, April 19-22, 2015

[2] M. Bruggi, **V. Zega**, A. Corigliano '*Optimization of auxetic structures for MEMS applications'* Eurosime 2016, Montpellier, France, April 17-20, 2016

[3] P. Minotti, G. Mussi, S. Dellea, A. Bonfanti, A.L. Lacaita, G. Langfelder, **V. Zega**, C. Comi, S. Facchinetti, A. Tocchio '*A 160 µA, 8 mdps/Hz$^{1}/_{2}$ frequency-modulated MEMS gyroscope'* Inertial '17, Kauai, Hawaii, USA, March 27-30, 2017

[4] G. Mussi, M. Bestetti, **V. Zega**, A. Frangi, G. Gattere, G. Langfelder '*Resonators for real-time clocks based on epitaxial polysilicon process: a feasibility study on system-level compensation of temperature drifts*' MEMS 2018, Belfast, Northern Ireland, January 21-25, 2018

[5] P. Minotti, G. Mussi, G. Langfelder, **V. Zega**, S. Facchinetti, A. Tocchio '*A system-level comparison of amplitude- vs frequency- modulation approaches exploited in low-power MEMS vibratory gyroscopes*' Inertial '18, Lake Como, Italy, March 26-29, 2018

[6] **V. Zega**, C. Credi, M. Invernizzi, R. Bernasconi, G. Langfelder, A. Cigada, L. Magagnin, M. Levi and A. Corigliano '*3D-printing and wet metallization for uniaxial and multi-axial accelerometers*' Eurosime 2018, Toulouse, France, April 15-18, 2018

[7] **V. Zega**, A. Nastro, L. D'Alessandro, M. Ferrari, R. Ardito, C. Valzasina, V. Ferrari and A. Corigliano '*Design and experimental validation of an auxetic phononic crystal for industrial micro-systems*' ESMC 2018, Bologna, Italy, July 2-6, 2018

[8] G. Langfelder, P. Minotti, **V. Zega**, C. Comi, C. R. Marra, M. Leoncini, M. Bestetti '*Frequency Modulated MEMS gyroscopes: recent developments, challenges and outlook*' Transducers 2019 – Eurosensors XXXIII, Berlin, Germany, June 23-27, 2019

[9] A. Bonanomi, E. Zappa, A. Cigada, **V. Zega**, A. Corigliano '*High speed vision system for the dynamic characterization of 3D printed sensors*' Journal of Physics: Conference Series 1249(1), 012001, 2019

[10] M. Bestetti, **V. Zega**, G. Langfelder, '*Modeling and first characterization of broad-spectrum vibration rejection of frequency modulated gyroscopes*', Proc. IEEE MEMS2020, Vancouver, Canada, January 23-28, 2020, 9056265, 259-262.

[11] G. Gobat, A. Frangi, **V. Zega**, '*Interpolation based reduced order modelling for non-linearities in MEMS*', IEEE SENSORS 2020, online conference, October 25-28, 2020.

[12] G. Gobat, **V. Zega**, P. Fedeli, L. G. Falorni, L. Guerinoni, C. Touzè, A. Frangi, '*Experimental evidence of mechanical frequency comb in a quad-mass MEMS structure*', IEEE MEMS 2021, online conference, January 25-29, 2021

[13] M. Gianollo, V. Mastri, **V. Zega**, M. Bestetti, L. Falorni, G. Langfelder, '*Miniaturized Quadruple Mass Gyroscopes: Challenges and Implementation*', IEEE SENSORS 2021, online conference, October 31st – November 4th, 2021

PATENTS

[1a] A. Tocchio, L. Falorni, C. Comi, **V. Zega** '*Giroscopio triassiale MEMS a modulazione di frequenza'* Deposited patent n. 102016000106928 (October 2016)

[1b] A. Tocchio, L. Falorni, C. Comi, **V. Zega** '*Frequency modulation MEMS triaxial gyroscope'* Patent n. US010520315B2 (December, 31st 2019)

[2a] L. D'Alessandro, **V. Zega**, E. Riva, R. Ardito, F. Braghin, A. Corigliano '*Dispositivo a modulo per l'isolamento vibro-acustico a bassa frequenza e ad ampio spettro, e relativa struttura periodica*' Deposited patent 102018000001510 (January 2018)

[2b] L. D'Alessandro, **V. Zega**, E. Riva, R. Ardito, F. Braghin, A. Corigliano '*Low-frequency and broad-speactrum vibro-acoustic insulating module device*' Deposited patent WO 2019/141794A1 (July 2019)

[3a] Z. Yao, **V. Zega**, Y. Su, J. Zhang, A. Corigliano '*Dispositivo MEMS con piastra d'isolamento vibrazioni'* Deposited patent 102020000012943 (May 2020)

[3b] Z. Yao, **V. Zega**, Y. Su, J. Zhang, A. Corigliano '*MEMS device with vibration-insulating plate'* Deposited patent PCT/EP2021/063865 (May 2021)

[4a] **V. Zega**, G. Gattere, A. Frangi, A. Opreni, M. Riani '*Accelerometro risonante ad asse z con struttura di rilevamento avente prestazioni migliorate*' Deposited patent n. 102021000023795 (September, 15th 2021)

RESEARCH PROJECTS

- Jan. 2019 – now: participation to the research project 'Studio e modellazione di micro sistemi elettro meccanici (MEMS)' – Politecnico di Milano/STMicroelectronics. (Coordinators: prof. A. Corigliano, prof. A. Frangi).
- May 2020 – now: participation to the project ECSEL JOINT UNDERTAKING, in the international program H2020-ECSEL, G.A. nr. 826452, Arrowhead Tools project (https://www.arrowhead.eu/arrowheadtools) in the research unit of Politecnico di Milano. (Coordinator: prof. A. Corigliano).
- Jan. 2017 – Sept. 2017: participation to the national project PRIN 2015-2018 entitled 'Multi-scale mechanical models for the design and optimization of microstructured smart materials and metamaterials' (Scientific Manager: prof. Alberto Corigliano).
- Jan. 2014 – June 2014: participation to the European project lab4MEMS grant no. 325622-2, Call ENIAC-2012-2. (Scientific Manager of the local unit: prof. Alberto Corigliano).

COLLABORATIONS

- Department of Mechanical and Aerospace Engineering at UCDavis, Davis, California, USA (MEMS group of prof. D. Horsley)
- Department of Electronics, Information and Bioengineering at Politecnico di Milano, Italy (prof. Langfelder group)
- Department of Mechanical Engineering at Politecnico di Milano, Italy (prof. Cigada, prof. Zappa and prof. Casati groups)
- Department of Chemistry, Materials and Chemical Engineering 'Giulio Natta' at Politecnico di Milano, Italy (prof. Magagnin and prof. Levi groups)
- Department of Physics at Politecnico di Milano, Italy (prof. Osellame group)
- Department of Information Engineering at Università di Brescia, Italy (proff. V. Ferrari and M. Ferrari group)
- Department of Mechanical Engineering at Stanford University, California, USA (prof. T. W. Kenny group)
- Mechanical engineering department at TU/Eindhoven, Eindhoven, The Netherlands (Mechanics of Material group of prof. M.G.D. Geers and prof. V. G. Kouznetsova).

- Nanjing University of Science and Technology, Nanjing, Cina (prof. Y. Su group)

CONFERENCE ORGANIZATION

- Chair of the *EUROMECH colloquium n° 616* – 'Unification of microsystems and metamaterials for new generation engineering solutions', Milan, Fall 2022.
- Technical Program Committee Member for the *IEEE EFTF-IFCS 2021*, virtual conference, 11-17 July 2021
- Technical Program Committee Member for the *IEEE MEMS2021*, virtual conference, 25-29 January 2021
- Technical Program Committee Member for the *IEEE MEMS2020*, Vancouver, Canada, 18-22 January 2020
- Local Organizing Committee member of the *ICTAM2020+1* conference, Milan, 22-27 August 2021
- Technical Reviewer for *IEEE SENSORS 2020* virtual conference, 25-28 October 2020
- Technical Reviewer for *IEEE SENSORS 2019* conference, Montreal, Canada, 27-30 October 2019
- Technical Reviewer for *IEEE INERTIAL2018* conference, Lake Como, Italy, 26-29 March 2018

INVITED SEMINARS

- '*A new out-of-plane resonant accelerometer*' (December 2015) – TDK-Invensense, San Jose, CA
- '*MEMS sensors for the measurements of angular velocity: mechanical and structural issues*' (May 2017) – University of Trento, Department of Civil, Environmental and Mechanical Engineering (prof. Pugno)
- '*Frequency-modulated gyroscopes*' (July 2017) – STMicroelectronics, Cornaredo, Italy
- '*MEMS: microsensori al servizio dell'uomo*' (September 2019) – MeetMeTonight, Notte dei ricercatori, Milano, Italy (https://www.youtube.com/watch?v=7i5Iey6f1PI)
- '*Metamaterials: from a theoretical study to applications in MEMS*' (May 2021) – Università degli studi di Cagliari, Department of mechanical, chemical and materials engineering (prof. Brun)

JOURNAL REVIEWS

- Member of the Reviewer Board of MDPI Sensors (https://www.mdpi.com/journal/sensors/submission_reviewers)
- Scientific Reports, Nature Journal
- Measurement Science and Technology Journal (IOPScience)
- Sensors & Actuators: A Physics
- Journal of Microelectromechanics and Microengineering
- Advanced Modelling and Simulation in Engineering Science
- Journal of Microelectromechanical Systems
- IEEE Sensors Letters
- Microsystem technologies (Springer)
- Microsystems & Nanoengineering (Springer Nature Limited and Chinese Academy of Science)
- European Journal of Mechanics/ A Solids
- KSCE Journal of Civil Engineering
- Micromachines (MDPI)

PROJECT REVIEWS

- Israeli Pazy Foundation. Established by the Israeli University Planning and Budgeting Committee (UPBC) and the Israeli Atomic Energy Commission (IAEC). The foundation's goal is to promote and support scientific research of high quality, carried out in collaboration between researchers at the universities and at R&D centers recognized to be part of the national science and technology infrastructure (and which carry out R&D for non-commercial purposes).

October 2021

Valentina Zega