Carlo Rosso

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Born: December 11, 1975—Savona, Italy
Nationality: Italian
Status: Married

Current position

Associate Professor, Department of Mechanical and Aerospace Engineering - Politecnico di Torino

Areas of specialization

Machine Design - Powertrain Component Design - Gears - Metal replacement

Appointments held

2004-2009 Grant recipient, Politecnico di Torino
2010 Professional experience, freelance
2011-2016 Assistant professor, Politecnico di Torino, Department of Mechanical and Aerospace Engineering
2016-now Associate professor, Politecnico di Torino, Department of Mechanical and Aerospace Engineering

Education

2001 MSc in Mechanical Engineering, Politecnico di Torino
2001 ENG Professional qualification, Minister of Instruction and Research, Italian Government
2005 PHD in Machine Design and Construction, Politecnico di Torino

Academic activities

2019-today	Member of the Department board
2019-today	Member of the steering committee of the Technology Transfer Laboratory
2004-today	Reviewer for some of the main journals in Mechanical science
2021	Academic editor of Journal Shock and Vibration

Public activities

1999-2009	Member of the city council of Monesiglio (CN)
2009-2013	Mayor of Monesiglio (CN)
1999-2013	Member of the council of the local Comunità Montana Alta Langa - Bossolasco (CN)
2020-today	President of the board of directors of GAL Langhe e Roero - Bossolasco (CN)
2020-today	President of the board of directors of Pruno s.r.l. - Prunetto (CN)
2022-today	President of the board of directors of GeDy TrAss s.r.l.

Grants, honors & awards

2005-2008	Grant recipient position for Thermo Mechanical Fatigue study, Politecnico di Torino
2008-2009	PostDoc fellowship, Politecnico di Torino
2018	Grant for the construction of a test bench for measuring static transmission error in gears
2019	GeDy TrAss company, founded by Carlo Rosso, is awarded of the Politecnico di Torino spinoff honor

Scientific activity

Carlo Rosso's research topics are principally related to the static and dynamic analysis, to the design and the experimental validation of mechanical structures and components. He is in particular involved in life assessment and dynamic behaviour of components both from numerical and experimental points of view. These kinds of activities, deeply linked to industrial needs, allow Carlo Rosso to collaborate with several industrial and academic researchers in the automotive, food and aerospace fields. He is active member of the SAE International since 2005.
He is also technical advisor of the Public Prosecutor's Offices of Torino, Mondovì, Ivrea and Vigevano.

Educational activity

Carlo Rosso gives lectures in the field of mechanical design at Politecnico di Torino since 2002, as assistant and examination commission member for graduate courses. He is also involved in lectures for a Master course (Structural Aspects in Diesel Engine Design and Energy Management for Powertrain) and for Ph.D. courses. He is tutor of more than 160 Bachelor (65) and Master Theses (95).

Teaching (All the years are referred to 2000)

04 - 23	Fundamentals of structural mechanics for graduation in AUTOMOTIVE ENGINEERING and MECHANICAL ENGINEERING
02 - 07; 10 - 16; 23	Fundamentals of machine design for graduation in different engineering fields
14	Internal combustion engine fundamentals for master in ENERGY MANAGEMENT FOR POWERTRAINS
11 - 23	Powertrain components design for graduation in AUTOMOTIVE ENGINEERING
14 and 16	Vehicle design for graduation in MECHANICAL ENGINEERING
15, 17, 19	Application of cell method in multiphysics analysis for Ph.D. in ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING and MECHANICAL ENGINEERING
15 and16	Dynamic design of gears for Ph.D in MECHANICAL ENGINEERING

Service to the profession

Reviewer for Scientific Journals:

- Mechanical Systems and Signal Processing
- Meccanica
- Journal of Process Mechanical Engineering
- ASME congress Turbo Expo
- SAE Technical Paper Series
- SAE International Journal of Engines
- Smart Science
- Engineering Science and Technology
- Journal of Advanced Manufacturing Technology
- Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science
- Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering
- Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering
- Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications
- Mechanics Based Design of Structures and Machines
- Sensors
- Energies
- Applied Sciences
- Machines

- IEEE Transactions on Vehicular Technology
- Shock and Vibration
- Measurement and Control
- Agriculture
- Materials
- Waste and Biomass Valorization

Technology Transfer Activities

Contratto	Inizio	Fine	Importo	Referenti Scientifici	Enti Coinvolti
Sviluppo di nuove pompe criogeniche	05.06.2023	31.12.2024	19.500,00	ROSSO CARLO	VANZETTI ENGINEERING S.R.L.
Valutazione delle prestazioni tribologiche in termini di coefficiente di attrito ed usura di 4 materiali plastici per uso alimentare in combinazioni	07.03.2023	06.05.2023	4.000,00	ROSSO CARLO	CMT S.P.A.
modellazione e ottimizzazione di dispositivo elettromagnetico per implantologia	11.05.2022	11.11.2022	27.000,00	ROSSO CARLO	MECTRON S.p.A.
"Implementation of fatigue life assessment methodology" and "Residual stresses and plastic deformation process simulation	29.03.2022	29.01.2024	160.000,00	BONISOLI ELVIO, ROSSO CARLO	MW Italia
Definizione dei parametri e dei modelli di fatica termomeccanica per 4 acciai idonei alla manifattura additiva	19.10.2020	29.01.2021	39.000,00	ROSSO CARLO	DACA-I Powetrain Engineering
parere tecnico su rottura coltelli per trinciasarmenti e proposta di metodologia di per progettazione"	29.09.2020	01.03.2021	12.000,00	ROSSO CARLO	HT ITE S R L
Parere tecnico su resistenza meccanica travi Magazzino M2: approfondimenti. Prof. Carlo Rosso	17.07.2020	31.08.2020	1.300,00	ROSSO CARLO	PAGLIERI S. P. A.
Ottimizzazione strutturale di turbina eolica ad asse verticale innovativa	25.05.2020	25.11.2020	10.000,00	ROSSO CARLO	ROTOR S.R.L.
Identificazione di strategie di costruzione di allineatori dentali innovativi	13.12.2019	15.01.2020	10.000,00	ROSSO CARLO	TARGET ORTODONZIA S.r.l.
Progettazione di dispositivo di misura per azioni impulsive	13.12.2019	15.02.2020	6.500,00	ROSSO CARLO	MECTRON S.p.A.
Parere tecnico su resistenza meccanica travi Magazzino M2	02.12.2019	01.02.2020	1.300,00	ROSSO CARLO	PAGLIERI S. P. A.
Revisione tecnica attività Ricerca e Sviluppo nel triennio 2015-2016-2017-PROGETTO DEFORMABILITA PRESSA	07.05.2019	06.09.2019	1.400,00	ROSSO CARLO	M. A. P. S. P. A.
Revisione tecnica attività Ricerca e Sviluppo nel triennio 2015-2016-2017-PROGETTO POLIMERI PER STAMPI	07.05.2019	06.09.2019	1.400,00	ROSSO CARLO	M. A. P. S. P. A.
methodology to streamline the design process of gearbox considering static and dynamic phenomena during the pre-design phase	14.06.2019	13.12.2020	100.000,00	ROSSO CARLO	FPT Industrial SPA
Revisione tecnica attività Ricerca e Sviluppo nel triennio 2015-2016-2017- PROGETTO ALLUMINIO	07.05.2019	03.10.2019	1.400,00	ROSSO CARLO	M. A. P. S. P. A.
Metodologia di caratterizzazione statica e a fatica di porzioni di scambiatore aria/acqua	06.07.2019	06.07.2019	9.000,00	DELPRETE CRISTIANA, ROSSO CARLO	DENSO THERMAL SYSTEMS S.p.A.
metodologia di caratterizzazione statica di porzioni di scambiatore aria/acqua	08.02.2019	07.04.2019	4.500,00	DELPRETE CRISTIANA, ROSSO CARLO	DENSO THERMAL SYSTEMS S.p.A.
Primed Rosso - bozza	02.10.2018	01.01.2019	10.000,00	ROSSO CARLO	PRIMED
DYNO activity for UHPE	11.07.2018	10.07.2018	34.250,00	ROSSO CARLO	GE AVIO S. R.L.
methodology development for advanced Engine Dynamics analysis	11.07.2018	10.07.2019	34.250,00	ROSSO CARLO	GE AVIO S. R.L.
Development and application of advanced methodologies for system dynamics Volume 2	28.03.2018	27.03.2019	34.250,00	ROSSO CARLO	GE AVIO S. R.L.

Figure 1: Main activities with companies.

Development and application of advanced methodologies for system dynamics - Volume 1	26.03.2018	25.03.2019	34.250,00	ROSSO CARLO		GE AVIO S.R.L.
Greatlab - Gearbox Dynamic 2018	19.12.2017	19.12.2018	90.000,00	ROSSO CARLO		GE AVIO S.R.L.
F.A.S.I. - Formazione Aziendale per lo Sviluppo Innovativo	27.10.2017	27.10.2018	6.250,00	BONISOLI ELVIO, ROSSO CARLO		BREDA LORETT S.R.L.
Fatigue evaluation and meta-modelisation for wheel life assessment	13.11.2017	31.12.2020	160.000,00	BONISOLI ELVIO, ROSSO CARLO		MW Italia
Progettazione e test di compressori oil free	19.09.2017	18.09.2018	40.000,00	ROSSO CARLO		ARIA COMPRESSA SPA SOCIETA' UNIPERSONALE I IA BAC O O MA
POLIGEAR DEVELOPMENT	15.06.2017	14.09.2017	4.650,00	ROSSO CARLO		GE AVIO S.R.L.
POLIGEAR AND ROTORDYNAMIC DEVELOPMENT	31.03.2017	31.12.2017	55.000,00	ROSSO CARLO		GE AVIO S.R.L.
GTT DIVISIONE TPL	09.03.2016	30.06.2016	6.840,00	ROSSO CARLO		GTT - GRUPPO TORINESE TRASPORTI S.P.A.
Studio, Progettazione e Test di componenti e sistemi inerenti i compressori a pistoni, i macchinari ed i componenti connessi al loro utilizzo	22.07.2016	21.07.2017	40.000,00	ROSSO CARLO		ARIA COMPRESSA SPA SOCIETA' UNIPERSONALE I IA BAC O O MA
torque test per alberi motore	17.02.2016	16.05.2016	15.080,00	ROSSO CARLO		A. Aria.C
Torque test per alberi motore	04.12.2015	03.01.2016	13.520,00	ROSSO CARLO		A. Aria.C
Torque test per alberi motore	28.09.2015	30.04.2016	18.720,00	ROSSO CARLO		A. Aria.C
Torque test per alberi motore - codici 1503290100 e 1503290400	09.04.2015	30.04.2015	3.120,00	ROSSO CARLO		A. Aria.C
Parere tecnico sulla metodologia di valutazione delle frequenze naturali di un sistema rotante per turbine idrauliche	24.02.2015	31.03.2015	4.000,00	ROSSO CARLO		ARDITO SRL
verifica corretto dimensionamento e funzionalità impianto porte autobus CITELIS 12 e 18 m	06.10.2014	30.12.2014	4.750,00	ROSSO CARLO		GTT - GRUPPO TORINESE TRASPORTI S.P.A.
PARERE TECNICO SUL DIMENSIONAMENTO DI UN ALBERO AD ELEVATA VELOCITÀ DI ROTAZIONE	14.02.2014	01.03.2014	8.500,00	ROSSO CARLO		TESEO S.p.A.
PARERE TECNICO SU MATERIALE PER DISCHI DECESPUGLIATORI	07.11.2013	07.01.2014	2.500,00	ROSSO CARLO		AGP
PARERE TECNICO SULLA DURATA DI TENDI CINGHIA PER MOTORI A COMBUSTIONE INTERNA	19.05.2011	30.07.2011	10.000,00	ROSSO CARLO		LORETT S.P.A.

Figure 2: Main activities with companies.

Publications & talks

Journals

Bruzzone, Fabio and Carlo Rosso. "Effect of Web Flexibility in Gear Engagement: A Proposal of Analysis Strategy". In: *Vibration* 5.2 (Mar. 2022), pp. 200–212. DOI: 10.3390/vibration5020013. URL: https://doi.org/10.3390%2Fvibration5020013.

Brusa, E et al. "Envelope analysis applied to non-Hertzian contact simulations in damaged roller bearings". In: *IOP Conference Series: Materials Science and Engineering* 1038.1 (Feb. 2021), p. 012013. DOI: 10.1088/1757-899x/1038/1/012013. URL: https://doi.org/10.1088%2F1757-899x%2F1038%2F1%2F012013.

Bruzzone, F et al. "Evaluation of the effect of profile modifications in gears subjected to sudden torque inversion". In: *IOP Conference Series: Materials Science and Engineering* 1038.1 (Feb. 2021), p. 012014. DOI: 10.1088/1757-899x/1038/1/012014. URL: https://doi.org/10.1088%2F1757-899x%2F1038%2F1%2F012014.

Bruzzone, Fabio, Tommaso Maggi, et al. "2D nonlinear and non-Hertzian gear teeth deflection model for static transmission error calculation". In: *Mechanism and Machine Theory* 166 (Dec. 2021), p. 104471. DOI: 10.1016/j.mechmachtheory.2021.104471. URL: https://doi.org/10.1016%2Fj.mechmachtheory.2021.104471.

– "Gear Teeth Deflection Model for Spur Gears: Proposal of a 3D Nonlinear and Non-Hertzian Approach". In: *Machines* 9.10 (Sept. 2021), p. 223. DOI: 10.3390/machines9100223. URL: https://doi.org/10.3390%2Fmachines9100223.

Giorcelli, Mauro, Mattia Bartoli, et al. "High-Temperature Annealed Biochar as a Conductive Filler for the Production of Piezoresistive Materials for Energy Conversion Application". In: *ACS APPLIED ELECTRONIC MATERIALS* (2021). DOI: 10.1021/acsaelm.0c00971. URL: https://pubs.acs.org/doi/abs/10.1021/acsaelm.0c00971.

Bartoli, M., C. Rosso, et al. "Effect of incorporation of microstructured carbonized cellulose on surface and mechanical properties of epoxy composites". In: *Journal of Applied Polymer Science* 137.27 (2020).

Brusa, Eugenio, Fabio Bruzzone, Cristiana Delprete, Luigi Gianpio Di Maggio, et al. "Health Indicators Construction for Damage Level Assessment in Bearing Diagnostics: A Proposal of an Energetic Approach Based on Envelope Analysis". In: *Applied Sciences* 10.22 (Nov. 2020), p. 8131. DOI: 10.3390/app10228131. URL: https://doi.org/10.3390%2Fapp10228131.

Bruzzone, F., C. Delprete, and C. Rosso. "Modelling Strategy and Parametric Study of Metal Gaskets for Automotive Applications". In: *COMPUTER MODELING IN ENGINEERING AND SCIENCES* 125 (2020), pp. 51–64. DOI: 10.32604/cmes.2020.011023.

Bruzzone, Fabio and Carlo Rosso. "Sources of Excitation and Models for Cylindrical Gear Dynamics: A Review". In: *Machines* 8.3 (July 2020), p. 37. DOI: 10.3390/machines8030037. URL: https://doi.org/10.3390%2Fmachines8030037.

Delprete, C., E. Brusa, et al. "Bearing Health Monitoring Based on the Orthogonal Empirical Mode Decomposition". In: *Shock and Vibration* 2020 (Jan. 2020), pp. 1–9. DOI: 10.1155/2020/8761278. URL: https://doi.org/10.1155%2F2020%2F8761278.

Razavykia, A. et al. "Functionality Analysis of Thermoplastic Composite Material to Design Engine Components". In: *SAE Technical Papers* 2020-April.April (2020).

Rosso, C., F. Bruzzone, et al. "Influence of Micro Geometry Modification on Gear Dynamics". In: *SAE Technical Papers* 2020-April.April (2020).

Rosso, C., T. Maggi, et al. "Test Bench for Static Transmission Error Evaluation in Gears". In: *SAE Technical Papers* 2020-April.April (2020).

Rovarino, D. et al. "A Methodology for Automotive Steel Wheel Life Assessment". In: *SAE Technical Papers* 2020-April.April (2020).

Rovarino, D. et al. “Hardware and Virtual Test-Rigs for Automotive Steel Wheels Design”. In: *SAE Technical Papers* 2020-April.April (2020).

Bartoli, M., M.A. Nasir, et al. “Influence of pyrolytic thermal history on olive pruning biochar and related epoxy composites mechanical properties”. In: *Journal of Composite Materials* (2019).

Bartoli, Mattia et al. “Influence of Commercial Biochar Fillers on Brittleness/Ductility of Epoxy Resin Composites”. In: *Applied Sciences* 9.15 (Aug. 2019), p. 3109. DOI: 10.3390/app9153109. URL: https://doi.org/10.3390%2Fapp9153109.

Bonisoli, E., C. Rosso, S. Venturini, et al. “Improvements on Design and Validation of Automotive Steel Wheels”. In: *Mechanisms and Machine Science* 73 (2019), pp. 1639–1649.

Bruzzone, F., C. Delprete, and C. Rosso. “A proposal of a unique formula for computing compliance in bolted joints”. In: *Procedia Structural Integrity* 24 (2019), pp. 167–177.

Bruzzone, F., T. Maggi, et al. “Proposal of a novel approach for 3D tooth contact analysis and calculation of the static transmission error in loaded gears”. In: *Procedia Structural Integrity* 24 (2019), pp. 178–189.

Fiorentini, F. et al. “Study of two alternative cooling systems of a mold insert used in die casting process of light alloy components”. In: *Procedia Structural Integrity* 24 (2019), pp. 569–582.

Giorcelli, Mauro, Aamer Khan, et al. “Biochar as a cheap and environmental friendly filler able to improve polymer mechanical properties”. In: *Biomass and Bioenergy* 120 (Jan. 2019), pp. 219–223. DOI: 10.1016/j.biombioe.2018.11.036. URL: https://doi.org/10.1016%2Fj.biombioe.2018.11.036.

Rosso, C., G. Belingardi, and V. Romagnoli. “Gearbox paradigm: A support for quick and effective gearbox design”. In: *SAE Technical Papers* 2019-April.April (2019).

Rosso, C., E. Bonisoli, and F. Bruzzone. “On the Implementation of Metastructures in Rotordynamics”. In: *Conference Proceedings of the Society for Experimental Mechanics Series* (2019), pp. 43–51.

– “On the veering phenomenon potential in high speed gears design”. In: *Conference Proceedings of the Society for Experimental Mechanics Series* (2019), pp. 135–142.

Khan, A. et al. “Innovative functionalized carbon fibers from waste: How to enhance polymer composites properties”. In: *Composites Part B: Engineering* 139 (2018), pp. 31–39.

Khan, Aamer, Pravin Jagdale, et al. “Carbon from waste source: An eco-friendly way for strengthening polymer composites”. In: *Composites Part B: Engineering* 132 (Jan. 2018), pp. 87–96. DOI: 10.1016/j.compositesb.2017.08.016. URL: https://doi.org/10.1016%2Fj.compositesb.2017.08.016.

Curà, F., A. Mura, and C. Rosso. “Investigation of crack propagation path in tube gears”. In: *Procedia Structural Integrity* 7 (2017), pp. 476–483.

Delprete, C. and C. Rosso. “Weight reduction through material changing in engine: piston pin and connecting rod case studies”. In: *INTERNATIONAL JOURNAL OF AUTOMOTIVE COMPOSITES* 3 (2017), pp. 83–100.

Delprete, C., C. Rosso, G. Savino, et al. “Advanced vision approach applied to non-contact micro-measurements: a practical application”. In: *International Journal of Advanced Manufacturing Technology* 88.1-4 (2017), pp. 471–481.

Khan, Aamer, Patrizia Savi, et al. “Low-Cost Carbon Fillers to Improve Mechanical Properties and Conductivity of Epoxy Composites”. In: *Polymers* 9.12 (Nov. 2017), p. 642. DOI: 10.3390/polym9120642. URL: https://doi.org/10.3390%2Fpolym9120642.

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– “Influence of high speed on crack propagation path in thin rim gears”. In: *Fatigue & Fracture of Engineering Materials & Structures* (2016). DOI: 10.1111/ffe.12481. URL: http://dx.doi.org/10.1111/ffe.12481.

Delprete, C., C. Rosso, C. Scarzella, et al. “Una microfabbrica nel biomedicale”. In: *IL PROGETTISTA INDUSTRIALE* Febbraio 2016 (2016), pp. 40–44.

Jagdale, P. et al. “Multiwalled carbon nanotube: Strength to polymer composite”. In: *Nanomaterials in Joining* (2016), pp. 1–22.

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– “Effect of rim and web interaction on crack propagation paths in gears by means of XFEM technique”. In: *Fatigue and Fracture of Engineering Materials and Structures* 38.10 (2015), pp. 1237–1245.

– “Investigation about crack propagation paths in thin rim gears”. In: *Frattura ed Integrita Strutturale* 30 (2014), pp. 446–453.

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– “Constitutive equations”. In: *Lecture Notes in Electrical Engineering* 230 (2013), pp. 21–47.

– “Implementation”. In: *Lecture Notes in Electrical Engineering* 230 (2013), pp. 115–129.

– “Multiphysics problems”. In: *Lecture Notes in Electrical Engineering* 230 (2013), pp. 91–114.

– “Preface”. In: *Lecture Notes in Electrical Engineering* 230 (2013).

– “Tonti diagrams”. In: *Lecture Notes in Electrical Engineering* 230 (2013), pp. 1–9.

– “Topological equations”. In: *Lecture Notes in Electrical Engineering* 230 (2013), pp. 11–20.

Bonisoli, E., G. Marcuccio, and C. Rosso. “Crossing and veering phenomena in crank mechanism dynamics”. In: *Conference Proceedings of the Society for Experimental Mechanics Series* 5 (2013), pp. 175–187.

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Delprete, C., F. Freschi, et al. “A proposal of nonlinear formulation of cell method for thermo-Elastostatic problems”. In: *CMES - Computer Modeling in Engineering and Sciences* 94.5 (2013), pp. 397–420.

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Delprete, C., F. Pregno, and C. Rosso. "Internal combustion engine design: A practical computational methodology". In: *SAE International Journal of Engines* 2.1 (2009), pp. 263–270.

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