

FEDERICO PEROTTI graduated in Civil Engineering, (Structural Engineering section) at Politecnico di Milano in 1981. In 1985 he received a “Master of Science in Civil Engineering” from University of California-Berkeley. He became Associate Professor at the Department of Civil Engineering of University of Brescia in 1992. In 1995 he moved to Politecnico di Milano, where he is presently Full Professor at the Department of Civil and Environmental Engineering.

Research

His research activity has been mainly in the fields of Structural Dynamics, Wind Engineering and Earthquake Engineering. His research work in the Structural Dynamics and Wind Engineering fields concerned the response of linear systems to non stationary random seismic excitation, the treatment of non-classically damped linear systems, the numerical performance of frequency domain analysis and the response of linear and non-linear systems under aerodynamic (wind) and hydrodynamic (seawaves) excitation. In the field of Earthquake Engineering he performed studies about the non-linear seismic response of steel structural systems, the seismic behaviour of r.c. bridges and the fragility of structural and equipment components in nuclear power plants. He is a member of the Task Force ANIMP (Associazione Nazionale di Impiantistica Industriale) - ECI (European Construction Institute) on modularization of industrial plants. He cooperates with the researchers and engineers working at the Boundary Layer Wind Tunnel of Politecnico di Milano on the development of structural design criteria based on experimental tests.

He is presently the Scientific Director of the Testing Lab for Materials, Buildings and Civil Structures of Politecnico di Milano.

He is author of about one hundred papers on refereed journals or conference proceedings.

Teaching

He has been professor of Structural Dynamics at the Faculty of Engineering of University of Brescia from 1987 to 1994, where he also taught the course of Earthquake Engineering Analysis and Design from 1992 to 1994. He is professor of Structural Dynamics (for Civil Engineering students) at Politecnico di Milano since 1995; since 2010 he is also in charge of the course of Theory of Structures for Mechanical Engineering students. Starting from Academic Year 2012-13 he has been also contributing to the “Wind Engineering” course, teaching a series of lessons on the structural analysis and design of tall buildings under wind excitation. He has been the Dean of the School of Civil and Environmental Engineering in the years 2011 and 2012.

Consulting and professional activity

Federico Perotti is *Qing* Certified Engineer at level 2 in the field of structures, with the following specialisation “Consulting, studies and analyses for supporting the design of industrial structures”.

His professional and consulting activity has been mainly focused on applications in Seismic Engineering and vibration problems in Civil Engineering. Among these we can quote the following.

- Seismic analysis of structural and equipment components in nuclear power plants.
- Design input and general criteria for the seismic analysis of the Messina Strait crossing.
- Dynamic analysis of large submerged structures under hydrodynamic and seismic excitation.
- Structural analysis and design of:
 - supporting structures for large turbine generators;
 - supporting structures for large printing systems;
 - foundations and supporting structures for other machines;
 - r.c. buildings in seismic areas;
 - long span beams and decks under dynamic loading;
 - wind effects on industrial plants,
 - mitigation of seismic and wind dynamic response.

Papers published on international journals

1. G. Grandori, E. Guagenti e F. Perotti, 'Some observations on the probabilistic interpretation of short-term earthquake precursors', *Earthquake Engineering and Structural Dynamics*, Vol. 12, p. 749-760, 1984.
2. G. Ballio and F. Perotti, 'Cyclic behaviour of axially loaded members: numerical simulation and experimental verification', *Journal of Constructional Steel Research*, 7, p. 3-41, 1987.
3. G. Grandori, E. Guagenti e F. Perotti, 'Alarm systems based on a pair of short-term earthquake precursors', *Bulletin of the Seismological Society of America*, Volume 78, N.4, p. 1538-1549, 1988.
4. F. Perotti, 'Structural response to non-stationary multiple-support random excitation', *Earthquake Engineering and Structural Dynamics*, Vol. 19, p. 513-527, 1990.
5. G. Grandori, A. Drei, F. Perotti e A. Tagliani, 'Macroseismic intensity versus epicentral distance: the case of central Italy', *Tectonophysics*, Vol. 193, no. 1-3, 1991.
6. F. Perotti e G.P. Scarlassara, 'Concentrically braced steel frames under seismic actions: non-linear behaviour and design coefficients', *Earthquake Engineering and Structural Dynamics*, Vol. 20, 409-427, 1991.
7. F. Perotti, 'Analytical and numerical techniques for the dynamic analysis of non-classically damped linear systems', *Soil Dynamics and Earthquake Engineering*, 13, 197-212, 1994. .
8. A. Feriani e F. Perotti, 'The formation of viscous damping matrices for the dynamic analysis of M.D.O.F. systems', *Earthquake Engineering and Structural Dynamics*, Vol. 25, 689-709, 1996.
9. L. Martinelli, M.G. Mulas e F. Perotti, 'The Seismic Response of Concentrically braced moment-resisting frames', *Earthquake Engineering and Structural Dynamics*, Vol. 25, 1275-1299, 1996.
10. F. Perotti, A. De Amici e P. Venturini, 'Numerical analysis and design implications of the seismic behaviour of one-storey steel bracing systems', *Engineering Structures*, Vol. 18, No. 2, pp. 162-178, 1996.
11. L. Martinelli , M.G. Mulas e F. Perotti, 'The seismic behaviour of steel moment-resisting frames with stiffening braces', *Engineering Structures*, Vol. 20, No. 12, pp. 1045-1062, 1998.
12. P. Riva, F. Perotti, E. Guidoboni e E. Boschi, 'Seismic behaviour of the Asinelli Tower and earthquakes in Bologna', *Soil Dynamics and Earthquake Engineering*, 17, pp. 525-550, 1998.
13. P. Fogazzi e F. Perotti, 'The dynamic response of seabed anchored floating tunnels under seismic excitation', *Earthquake Engineering and Structural Dynamics*, 29, pp. 273-295, 2000.
14. A. Feriani, F. Perotti e V. Simoncini, 'Iterative system solvers for the frequency analysis of linear mechanical systems', *Computer Methods in Applied Mechanics and Engineering*, 190, pp. 1719-1739, 2000.
15. L. Martinelli e F. Perotti, 'Numerical analysis of the non-linear dynamic behaviour of suspended cables under turbulent wind excitation', *Int. Jour. Of Structural Stability and Dynamics*, Vol. 1, No. 2, pp. 207-234, 2001.

16. Simoncini, V., Perotti, F., 'On the numerical solution of $(\lambda^2 A + \lambda B + C)x=b$ and application to structural dynamics', *SIAM J. Sci. Comput.*, Vol. 23, No.6, pp. 1876-1898, 2002.
17. Di Prisco C., Nova R., Perotti F., Sibilìa A., 'Analysis of soil-foundation interaction of tower structures under cyclic loading', in '*Geotechnical analysis of seismic vulnerability of historical monuments*', M.Maugeri & R. Nova editors, Chapter 5, pp. 123-136, Pàtron, Bologna, 2003.
18. F. Perotti, V. Simoncini, 'Analytical and numerical techniques in frequency domain response computation', in '*Recent Research Developments in Structural Dynamics*', A. Luongo ed., Research Signpost, Trivandrum, India, 2003.
19. V. Gattulli, L. Martinelli, F. Perotti e F. Vestroni, 'Nonlinear oscillations of cables under harmonic loading using analytical and finite element models', *Comput. Methods Appl. Mech. Engrg.* 193, pp. 69-85, 2004.
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21. Di Pilato M, Perotti F and Fogazzi P, '3D dynamic response of submerged floating tunnels under seismic and hydrodynamic excitation', *Engineering Structures*, Volume 30, Issue 1, pp. 268-281, 2008.
22. Di Pilato M., Feriani A., Perotti F., "Numerical models for the dynamic response of submerged floating tunnels under seismic loading" *Earthquake Engineering and Structural Dynamics* 37 (9), pp. 1203-1222, 2008.
23. F. M. Mazzolani, R. Landolfo, B. Faggiano, M. Esposto, F. Perotti, G. Barbella, 'Structural Analyses of the SFT Prototype on Qiandao Lake', *Advances in Structural Engineering* 11 (4), pp. 439-454, 2008.
24. De Grandis S., Domaneschi M. and Perotti F., 'A numerical procedure for computing the fragility of NPP components under random seismic excitation', *Nuclear Engineering and Design* 239, pp. 2491-2499, 2009.
25. Barbella G., Perotti F. and Simoncini V., 'Block Krylov subspace methods for the computation of structural response to turbulent wind', *Computer Methods in Applied Mechanics and Engineering*, 200, 23–24, 2067–2082, Jun 2011.
26. F. Perotti, M. Domaneschi, S. De Grandis, 'The numerical computation of seismic fragility of base-isolated NPP buildings', *Nuclear Engineering Design*, 262. pp. 189-200, 2013.
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31. F. Perotti, 'Dinamica e vibrazioni nelle strutture dell'ingegneria civile', *Structural* 194, Febbraio-Marzo, 2015, paper 04, ISSN 2282-3794, DOI 10.12917/Stru194.04, 2015.
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