

CRESCENZO PETRONE

Research Associate

Civil, Environmental & Geomatic Engineering, University College London, London WC1E 6BT

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Research Interests

- Tsunami analysis of structures
- Earthquake-tsunami fragility of structures
- Seismic performance of nonstructural components
- Experimental tests on structural and nonstructural components
- Seismic performance of RC precast structures
- Seismic design of RC structures
- Seismic performance of hospital building contents
- Nonstructural component modelling
- Floating offshore wind turbines
- Fluid-structure interaction in cables

EDUCATION

Ph.D. in Seismic Risk

May 2014

University of Naples Federico II (Italy)

- Dissertation: "Nonstructural Components: seismic capacity and demand"

M. Sc. in Structural and Geotechnical Engineering

December 2010

University of Naples Federico II (Italy)

- Thesis: "Inelastic seismic response and risk analysis of multi-storey precast buildings"

B. Eng. in Civil Engineering

September 2008

University of Naples Federico II (Italy)

- Thesis: "Experimental tests on the seismic behavior of beam-column connections in precast structures" (in Italian)

ACADEMIC EMPLOYMENT

University College London (UK)

September 2015 - present

Research Associate

University at Buffalo, the State University of New York

June 2014 – December 2014

Visiting research scholar

University of Naples Federico II (Italy)

March 2011 – September 2015

Post-Doc Research Fellow

Graduate Research Assistant

AWARDS AND RECOGNITION

- Scholarship funded by COINOR at University of Naples for supporting a research activity at the University at Buffalo, the State University of New York (USA) from June 2014 to December 2014 (Advisor: Dr. M. Sivaselvan), 2014
- Erasmus scholarship funded by University of Naples for supporting an internship at University of Ljubljana (Slovenia) from June 2010 to December 2010 (Advisors: Prof. M. Fischinger, Prof. T. Isakovic), 2010
- Award "Quality and excellence in higher education" given by the Industrial Union - Corriere del Mezzogiorno/Corriere della Sera, 2008.

- Student of the B. Eng. in Civil Engineering with the highest average grade for the first, second and third years, 2006-2008

GRANTS AND RESEARCH PROJECTS

Modelling mooring cables in floating offshore wind turbines taking into account fluid-structure interaction, €10k

University at Buffalo, the State University of New York

June 2014 – December 2014

Role: PI

“Offshore Wind Energy in the Great Lakes – Technological, Ecological, Socio-economic and Policy Factors to create a Comprehensive Modeling and Simulation Framework”, \$37k

University at Buffalo, the State University of New York

2015

Role: Co-I

“Assessment of the seismic performance of internal partitions for office use”, funded by Mangini srl, €40k

University of Naples Federico II

November 2013 – July 2014

Role: Co-I

“Study of non-bearing plasterboard systems in the seismic domain and development of new earthquake-resistant systems”, funded by Siniat International, €199k

University of Naples Federico II

May 2012 – April 2016

Role: Co-I

CRUST: Cascading Risk and Uncertainty assessment of earthquake Shaking and Tsunami

University College London

September 2015 -

Role: Research Associate

Urban Waves: evaluating structure vulnerability to tsunami and earthquakes

University College London

September 2015 -

Role: Research Associate

“Smart Case: Innovative solutions for multi-functional optimization of primary energy consumption and indoor habitability of buildings”

University of Naples Federico II

2014 - 2015

Role: Research scientist

“PON Strit: tools and technologies for risk management of transportation infrastructures”

University of Naples Federico II

2014 - 2015

Role: Research scientist

“ReLUIS–DPC 2014-2018 – RS8 Capacity of nonstructural components”, funded by the Italian Department of Civil Protection

University of Naples Federico II

2014 - 2015

Role: Research scientist

“Study of non-bearing plasterboard systems in the seismic domain and development of new earthquake-resistant systems”, funded by Lafarge Gypsum

University of Naples Federico II

March 2011 – May 2012

Role: Research assistant

“ReLUIS–DPC 2010-2013 – AT1 Assessment of existing buildings, retrofitting actions and assessment of the seismic risk of areas using a macro-scale approach”, funded by the Italian Department of Civil Protection

University of Naples Federico II

2011 –2013

Role: Research assistant

TEACHING EXPERIENCE

Co-Instructor 2016

University College London

- “Advanced seismic design of structures” module (CEGEG140) for MSc students
- “Seismic Risk Assessment” module (CEGEG022) for MSc students

Co-Instructor, Teaching Assistant 2011 - 2015

University of Naples Federico II

- “Seismic design of RC structures” module for 100+ MSc students
- Co-Advisor and member of the Board of Examiners of 14 MSc dissertations in Structural and Geotechnical Engineering

Instructor 2014

STRESS S.c. a r.l. consortium, Naples

"Fundamentals of Seismic Engineering" course for "Expert researchers in monitoring infrastructures" in the framework of the PON Strit project

RESEARCH SUPERVISION

Ph.D. Dissertation, Co-supervisor

University of Naples Federico II

- Mr. Marco Mastrovito 2013 – 2016

Graduate research assistant, Co-supervisor

University of Naples Federico II

- Mr. Marco Russo June 2012 – June 2013
- Mr. Fabio Gustuti January 2014 – December 2014
- Mr. Luigi Giannetti June 2014 – February 2015
- Ms. Antonella Guerra January 2015 – July 2015
- Mr. Giuseppe Ingusci April 2015 – July 2015

MSc thesis, Co-supervisor

University at Buffalo, the State University of New York

- Mr. Yehezkiel Tumewu (M.Sc. in Structural and Earthquake Engineering) June 2015 -

PUBLICATIONS and PRESENTATIONS

Refereed journal articles:

- C. Petrone, G. Magliulo, P. Lopez, G. Manfredi. Out-of-plane seismic performance of plasterboard partitions via quasi-static tests. Bulletin of the New Zealand Society of Earthquake Engineering (in press)
- C. Petrone, G. Magliulo, G. Manfredi. Floor response spectra in RC frame structures designed according to Eurocode 8. Bulletin of Earthquake Engineering 2016, 14(3):747-767.
- C. Petrone, N. Oliveto, M. Sivaselvan. Dynamic analysis of mooring cables with application to floating offshore wind turbines. Journal of Engineering Mechanics – ASCE, DOI: 10.1061/(ASCE)EM.1943-7889.0000999 (online early)
- C. Petrone, G. Magliulo, P. Lopez, G. Manfredi. Seismic fragility of plasterboard partitions via in-plane quasi-static tests. Earthquake Engineering and Structural Dynamics 2015, 44(14): 2589-2606
- L. Di Sarno, C. Petrone, G. Magliulo, G. Manfredi. Dynamic properties of typical consultation room medical components. Engineering Structures 2015. 100(1):442-454

- C. Petrone, G. Magliulo, G. Manfredi. Seismic demand on light acceleration-sensitive nonstructural components in European reinforced concrete buildings. *Earthquake Engineering and Structural Dynamics* 2015; 44(8): 1203-1217
- E. Cosenza, L. Di Sarno, G. Maddaloni, G. Magliulo, C. Petrone, A. Prota. Shake table tests for the seismic fragility evaluation of hospital rooms. *Earthquake Engineering and Structural Dynamics* 2015; 44(1): 23–40
- C. Petrone, G. Magliulo, G. Manfredi. Shake table tests for the seismic assessment of hollow brick internal partitions. *Engineering Structures*. 2014; 72: 203-214
- G. Magliulo, C. Petrone, V. Capozzi, G. Maddaloni, P. Lopez, G. Manfredi. Seismic performance evaluation of plasterboard partitions via shake table tests. *Bulletin of Earthquake Engineering* 2014; 12(4): 1657-1677
- L. Di Sarno, C. Petrone, G. Magliulo, G. Maddaloni, E. Cosenza. Analisi sperimentale mediante prove su tavola vibrante della distribuzione della richiesta sismica su componenti non strutturali (Experimental analysis of the distribution of the seismic demand on nonstructural components via shake table tests). *Progettazione sismica* 2014; 5(1):83-95
- G. Magliulo, M. Ercolino, C. Petrone, O. Coppola, G. Manfredi. The Emilia Earthquake: the Seismic Performance of Precast Reinforced Concrete Buildings, *Earthquake Spectra*. 2014; 30(2):891-912
- G. Magliulo, G. Maddaloni, C. Petrone. Influence of the earthquake direction on seismic response of irregular plan existing RC frame buildings. *Earthquake Engineering and Engineering Vibration* 2014; 13(2):243-256
- G. Magliulo, G. Maddaloni, C. Petrone. Comparison among different scaling methods for earthquake records used for seismic nonlinear analysis of structures. *Disaster Advances* 2014; 7(1): 39-49
- G. Magliulo, M. Ercolino, C. Petrone, O. Coppola, G. Manfredi. Il ruolo dei collegamenti nella risposta sismica esibita dalle strutture prefabbricate durante il terremoto dell’Emilia (The role of connections in the seismic performance of RC precast structures during Emilia earthquake) (in Italian with English abstract), *Progettazione Sismica*, N. 03 2012
- G. Magliulo, C. Petrone, V. Capozzi, G. Maddaloni, P. Lopez, R. Talamonti, G. Manfredi. Shake Table Tests On Infill Plasterboard Partitions. *The Open Construction and Building Technology Journal – Special Issue: Advances in Infilled Framed Structures: Experimental & Modelling Aspects* 2012. 6, (Suppl 1-M10): 155-163
- G. Magliulo, V. Pentangelo, G. Maddaloni, V. Capozzi, C. Petrone, P. Lopez, R. Talamonti, G. Manfredi. Shake Table Tests For Seismic Assessment Of Suspended Continuous Ceilings. *Bulletin of Earthquake Engineering* 2012; 10 (6):1819-1832

Refereed journal articles under review/in preparation:

- C. Petrone, G. Magliulo, G. Manfredi. Plasterboard mechanical properties: experimental tests and statistical analysis. *Journal of Materials in Civil Engineering- ASCE* (under review)
- C. Petrone, L. Di Sarno, G. Magliulo. Numerical modelling and fragility assessment of typical freestanding building contents. *Earthquake Engineering and Structural Dynamics* (under review)
- C. Petrone, G. Magliulo, G. Manfredi. Shake table tests on standard and innovative temporary partitions walls. *Earthquake Engineering and Structural Dynamics* (in preparation)
- M. Ercolino, C. Petrone, G. Magliulo, G. Manfredi. Critical review of Eurocode 8 seismic design of single-story precast structures for P- Δ effects. *Structural Design Of Tall And Special Buildings* (in preparation)

- C. Petrone, O. Coppola, G. Magliulo, P. Lopez, G. Manfredi. Numerical model for the in-plane seismic capacity evaluation of plasterboard internal partitions. *Earthquake Engineering and Structural Dynamics* (in preparation)

Chapters in books:

- G. Magliulo, C. Petrone, G. Manfredi. Seismic demand on acceleration-sensitive nonstructural components. *Computational Methods in Earthquake Engineering - Vol. 3*, by Springer (under review)
- G. Magliulo, C. Petrone, G. Maddaloni, P. Lopez, G. Manfredi. Evaluation of the seismic capacity of nonstructural components. *Computational Methods, Seismic Protection, Hybrid Testing and Resilience in Earthquake Engineering - A tribute to the research contribution of Prof. Andrei Reinhorn 2015*, 33: 97-109. ISBN: 978-3-319-06393-5, DOI: 10.1007/978-3-319-06394-2__7

Conference papers and presentations:

- C. Petrone, T. Rossetto, K. Goda, R. De Risi. Combined ground motion-tsunami analytical fragility of RC structures. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- C. Petrone, T. Rossetto, I. Eames. Tsunami analysis of structures: comparison among different approaches. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- C. Petrone, G. Magliulo, L. Giannetti, G. Manfredi. Stress-strain behavior of plasterboards subjected in tension and compression. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- M. Ercolino, C. Petrone, G. Magliulo, A. Guerra, G. Manfredi. On the seismic design of one-story precast structures for P- Δ effects. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- C. Petrone, L. Di Sarno, G. Magliulo. Validation of numerical models for hospital building contents: rigid block and FEM models. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- C. Petrone, G. Magliulo, G. Manfredi. Seismic demand on nonstructural components due to frequent earthquakes. 16th World Conference on Earthquake Engineering. Santiago, Chile, 9-13 January 2017 (under review)
- L. Di Sarno, C. Petrone, G. Magliulo, G. Manfredi. Experimental Seismic Performance Assessment of Hospital Building Contents. 2nd conference on improving the seismic performance of existing buildings and other structures. San Francisco, CA, US, 10-12 December 2015 (under review)
- C. Petrone, G. Magliulo, P. Lopez, G. Campanella, M. Russo, G. Manfredi. Seismic performance of plasterboard partitions via in-plane quasi-static test. ANIDIS 2015 Conference, 13 September - 17 September 2015, L'Aquila (Italy)
- C. Petrone, G. Magliulo, G. Manfredi. Acceleration seismic demand on light nonstructural components in European RC frame structures. ANIDIS 2015 Conference, 13 September - 17 September 2015, L'Aquila (Italy)
- L. Di Sarno, G. Manfredi, G. Magliulo, C. Petrone, A. Masi, G. Santarsiero, G. Fabbrocino, C. Rainieri, J. Mitrani-Reiser, S. Giovinazzi. An Approach to Evaluate the Seismic Performance of Medical Components. ANIDIS 2015 Conference, 13 September - 17 September 2015, L'Aquila (Italy)

- C. Petrone, M. Mastrovito, G. Magliulo. Analisi della risposta sismica di una struttura prefabbricata a seguito del sisma dell'Emilia Romagna del 2012. IF CRASC '15, III convegno di ingegneria forense, VI convegno su crolli, affidabilità strutturale, consolidamento. Rome, 14-16 May 2015
- C. Petrone, G. Magliulo, P. Lopez, G. Manfredi. Out-of-plane seismic performance of high plasterboard partitions via quasi-static tests. Second International Workshop on Seismic Performance of Non-Structural Elements (SPONSE). Pavia, Italy, 13 May 2015
- L. Di Sarno, F. Gustuti, G. Magliulo, C. Petrone. Seismic fragility assessment of medical components. COMPDYN 2015 5th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering. Crete Island, Greece, 25 - 27 May 2015
- C. Petrone, G. Magliulo, M. Russo, G. Manfredi. Seismic performance of hollow brick internal partitions. COMPDYN 2015 5th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering. Crete Island, Greece, 25 - 27 May 2015
- C. Petrone, N. Oliveto, M. Sivaselvan. Modeling of mooring systems in floating offshore wind turbines. EMI2015 Engineering Mechanics Institute conference. Stanford, CA, US, 16-19 June 2015.
- C. Petrone, G. Magliulo, G. Manfredi. Dynamic identification of nonstructural components via shake table test. International Workshop on the Seismic Performance of Non-structural Elements (SPONSE), Harbin, China, 29-31 August 2014.
- L. Di Sarno, C. Petrone, G. Magliulo, G. Maddaloni and A. Prota. Shake table tests to evaluate the seismic demand, capacity and dynamic properties of hospital contents. Second European conference on earthquake engineering and seismology, Istanbul, 25-29 August 2014.
- C. Petrone, G. Magliulo, M. Cimmino, G. Manfredi. Evaluation of the seismic demand on acceleration-sensitive nonstructural components in RC frame structures. Second European conference on earthquake engineering and seismology, Istanbul, 25-29 August 2014.
- G. Magliulo, M. Ercolino, C. Petrone, O. Coppola, G. Manfredi. Why did many precast RC buildings collapse during the 2012 Emilia earthquakes? Second European conference on earthquake engineering and seismology, Istanbul, 25-29 August 2014.
- E. Cosenza, L. Di Sarno, G. Maddaloni, G. Magliulo, G. Manfredi, C. Petrone, A. Prota. Theoretical and Experimental Study on the Contents of Hospital Buildings. Tenth U.S. National Conference on Earthquake Engineering, Frontiers of Earthquake Engineering, Alaska, 21-25 July 2014. DOI: 10.4231/D30G3GZ9S
- C. Petrone, G. Magliulo, G. Manfredi. Shake table tests for the seismic assessment of hollow brick internal partitions. 2014 ASCE Structures Congress, Boston, April 3-5, 2014 pages 1836-1845. ISBN: 978-0-7844-1335-7, DOI: 10.1061/9780784413357.162
- G. Magliulo, C. Petrone, V. Capozzi, G. Maddaloni, P. Lopez, G. Manfredi. Seismic performance evaluation of plasterboard partitions via shake table tests. 2014 ASCE Structures Congress, Boston, April 3-5, 2014 pages 1846-1856. ISBN: 978-0-7844-1335-7, DOI: 10.1061/9780784413357.163
- G. Magliulo, C. Petrone, G. Maddaloni, P. Lopez, G. Manfredi. Evaluation of the seismic capacity of nonstructural components. Reinhorn Symposium, Buffalo, New York, 30 September 2013.
- G. Magliulo, C. Petrone, P. Lopez, G. Manfredi. Evaluation of the seismic capacity and demand of nonstructural components. Vienna Congress on Recent Advances in Earthquake Engineering and Structural Dynamics, Wien, 28-30 August 2013.

- G. Magliulo, G. Maddaloni, C. Petrone. A procedure to select time-histories for shaking table tests on nonstructural components. COMPDYN 2013 4th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering. Kos Island, Greece, 12–14 June 2013.
- C. Petrone, G. Magliulo, V. Capozzi, G. Maddaloni, P. Lopez, R. Talamonti, G. Manfredi. Valutazione della prestazione sismica di partizioni in cartongesso attraverso prove su tavola vibrante. ANIDIS 2013, 30 June - 4 July 2013, Padova (Italy). ISBN: 9788897385592
- G. Magliulo, V. Pentangelo, G. Maddaloni, V. Capozzi, C. Petrone, P. Lopez, R. Talamonti, G. Manfredi. Prove su tavola vibrante su controsoffitti continui in cartongesso. ANIDIS 2013, 30 June - 4 July 2013, Padova (Italy). ISBN: 9788897385592
- M. Ercolino, G. Magliulo, C. Petrone, O. Coppola, G. Manfredi, Il terremoto del 20 e del 29 maggio 2012 in Emilia Romagna: la prestazione sismica delle strutture prefabbricate in c.a. (in Italian), Collegamenti nelle Strutture Prefabbricate – Connections in Precast Structures, 5 October 2012, Bergamo (Italy). ISBN: 978-88-904292-9-3
- G. Magliulo, C. Petrone, V. Pentangelo, G. Manfredi. Danneggiamento di componenti non strutturali a seguito del terremoto dell'Aquila dell'aprile 2009. In: Atti del II Convegno di Ingegneria Forense - V Convegno su CRolli, Affidabilità Strutturale, Consolidamento. Pisa, 15-17 novembre 2012, NAPOLI: DoppiaVoce, p. 609-617, ISBN/ISSN: 9788889972342.
- G. Magliulo, V. Pentangelo, G. Maddaloni, V. Capozzi, C. Petrone, G. Manfredi. Shake Table Tests On Plasterboard Continuous Ceilings. Proceedings of 15th World Conference on Earthquake Engineering, Lisboa - Portugal, 24-28 September 2012.
- C. Petrone, G. Magliulo, G. Maddaloni, V. Capozzi, G. Manfredi. Plasterboard Partitions Seismic Performance Evaluation Via Shake Table Test. Proceedings of 15th World Conference on Earthquake Engineering, Lisboa - Portugal, 24-28 September 2012.
- M. Fischinger, M. Ercolino, M. Kramar, C. Petrone, T. Isakovic. Inelastic seismic shear in multi-storey cantilever columns. 3rd International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering - COMPDYN 2011, Corfù (Greece), 25-28 May 2011. ISBN: 978-960-99994-0-3

Attendance to the following conferences:

- 15th World Conference on Earthquake Engineering (Lisbon, 24-28 September 2012), presenting "Plasterboard partitions seismic performance evaluation via shake table test" and "Shake table tests on plasterboard continuous ceilings" (e-poster)
- XIV Convegno ANIDIS "Earthquake Engineering in Italy" (Padova, 30 June - 4 July 2013) presenting "Valutazione della prestazione sismica di partizioni in cartongesso con prove su tavola vibrante" and "Prove su tavola vibrante di controsoffitti continui in cartongesso"
- Vienna Congress on Recent Advances in Earthquake Engineering and Structural Dynamics & 13. D-A-CH Tagung (Wien, 28-30 August 2013), presenting "Evaluation of the seismic capacity and demand of nonstructural components"
- Conference Structures Congress 2014 (Boston, 3-5 April 2014), presenting "Seismic Performance Evaluation of Plasterboard Partitions via Shake Table Tests" and "Shake Table Tests for the Seismic Assessment of Hollow Brick Internal Partitions"
- Second International Workshop on Seismic Performance of Non-Structural Elements - SPONSE (Pavia, Italy, 13 May 2015)
- COMPDYN 2015, 5th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (Crete Island, Greece, 25–27 May 2015), presenting "Seismic fragility assessment of medical components" and "Seismic performance of hollow brick internal partitions"

Invited lectures/seminars:

- Nonstructural components: seismic capacity and demand, University of Canterbury, Christchurch, New Zealand, 3 March 2015
- “Seismic performance of nonstructural components”, University of Ljubljana (Slovenia), 3 December 2015

Research reports, Theses and dissertations

- C. Petrone, Nonstructural Components: seismic capacity and demand, PhD thesis, University of Naples Federico II, 2014
- M. Ercolino, O. Coppola, C. Petrone, G. Magliulo, “Survey of the recorded damage in Mirandola (MO) after the 29 May 2012 seismic event” (in Italian)
http://www.reluis.it/images/stories/2012_05_29_report%20Mirandola.pdf
- M. Ercolino, C. Petrone, O. Coppola, G. Magliulo, “Survey of the recorded damage in San Felice sul Panaro (MO) after the 20 and 29 May 2012 seismic events” (in Italian)
http://www.reluis.it/images/stories/report_San-Felice-sul-Panaro_20-29maggio.pdf

Patents:

- C. Petrone, G. Magliulo, E. Vial, R. Arese, P. Lopez. Seismic damage reducing system for partitions.
 - European patent. Request no.: 13290324.6 - 1604; request date: 20 December 2013. Property: Siniat International SAS. Marketed by: Siniat International SAS.
 - International Patent System – Patent Cooperation Treaty (PCT). Application no. EP2014/078834; request date: December 2014.
- C. Petrone C., G. Magliulo, E. Vial, N. Costa, P. Lopez. Protective structure for board partitions.
 - European patent. European application no. 13221 131015. Property: Siniat International SAS. Marketed by: Siniat International SAS.
 - International Patent System – Patent Cooperation Treaty (PCT). Application no. EP2014/078829; request date: December 2014.
- P. Ponzio, G. Magliulo, C. Petrone, S. Geografo. Unhooking device SPS Safe Partition System.
 - Italian patent. Dispositivo antisganciamento SPS Safe Partition System. Application no. 102015000024909. Property: Mangini srl. Marketed by: Mangini srl. Request date: 17 June 2015.

MEMBERSHIP and SERVICE

- Reviewer for Earthquake Engineering and Structural Dynamics, Bulletin of Earthquake Engineering and Earthquake Engineering and Engineering Vibration
- Member of American Society of Civil Engineers (ASCE)
- Licensed Professional Engineer in Italy, since January 2012
- Web editor for Epicentre website

SKILLS

- Research and professional skills
 - Design and execution of experimental tests
 - Nonlinear modelling of RC structures
 - Modelling of nonstructural components
 - Compilation of post-earthquake damage analysis
 - Ability to work on multiple projects

- Computer skills
 - Matlab (High proficiency)
 - MS OFFICE (High proficiency)
 - Structural analysis software: OpenSees and SAP2000 (High proficiency)
 - Visual Basic and C++ (Basic knowledge)
 - Autocad