

Alessandro Contento

EDUCATION

University of Illinois at Urbana-Champaign, Urbana (2014-2020)

Ph.D. in Civil Engineering

Dissertation: Modeling of hurricane-storm surge occurrences and analysis of their financial implications

Research Supervisors: *Paolo Gardoni***University of Illinois at Urbana-Champaign, Urbana (2019-2020)**

Master of Arts in Applied Statistics

University of L'Aquila, Italy (2005-2009)

Ph.D. in Civil and Environmental Engineering

Thesis: A toy model for contact simulations

Research Supervisors: *Angelo di Egidio***University of L'Aquila, Italy (2000-2005)**

Laurea (equivalent to BS and MS) in Structural Engineering, Grade: 100/100 cum laude

Thesis: Seismic Mitigation for Objects of Art by Means of Base Isolation (In Italian)

Research Supervisors: *Angelo di Egidio*

ACADEMIC POSITIONS AND PROFESSIONAL EXPERIENCE

Visiting Professor (Fall 2018, Fall 2020)

Department of Civil, Construction-Architectural and Environmental Engineering, University of L'Aquila

Post-Doctoral Researcher (2009-2014)

Department of Civil, Construction-Architectural and Environmental Engineering, University of L'Aquila

Consultant (2009-2014)

Astra Energia, L'Aquila, Italy

Tec. Inn. S.r.l., Perugia, Italy

Consultant (2010-2013)

The First Brick, Perugia, Italy

Graduate Student Researcher (2015-2020)

University of Illinois at Urbana-Champaign

Project funded by NIST - U.S. National Institute of Standard and Technology project (grant number 70NANB15H044)

Research Supervisor: *Paolo Gardoni*

RESEARCH INTERESTS

- Risk, Reliability, and Resilience Analysis
- Earthquake Engineering
- Structural Dynamics
- Modeling of Tropical Storms and Climate Change

ACADEMIC AWARDS AND FELLOWSHIPS

Loreta and Silvio Corsetti Memorial Scholarship (Fall 2014)

College of Engineering, University of Illinois at Urbana-Champaign

Award of Conference Travel Fellowship (Spring 2018)

University of Illinois at Urbana-Champaign

SUMMARY OF THE MAIN BIBLIOMETRIC INDICATORS (SCOPUS)

Total number of publications in international journals or edited volumes: 30

H-index: 10

Total number of citations: 440

BOOK CHAPTERS

1. Tatone, A., Di Egidio, A., and Contento, A. (2011). "Dynamics of a soft contractile body on a hard support," in Giorgio Zavarise and Peter Wriggers (Eds.), *Trends in computational mechanics - Lecture Notes in Applied and Computational*, Springer-Verlag, ISBN: 978-3-642-22166-8.
2. Di Egidio, A., and Contento, A. (2012). "Seismic protection of monolithic objects of art using a constrained oscillating base," in Abbas Moustafa (Ed.), *Advances in Geotechnical Earthquake Engineering - Soil Liquefaction and Seismic Safety of Dams and Monuments*, InTech - Open access publisher, ISBN: 978-953-51-0025-6.
3. Contento*, A., Di Egidio, A., and Zulli, D. (2013). "Seismic behavior of monolithic objects of art: a 3D approach," in Sebastiano D'Amico (Ed.), *Engineering Seismology, Geotechnical and Structural Earthquake Engineering*, InTech - Open access publisher, ISBN: 978-953-51-1038-5.
4. Contento*, A., Xu, H., and Gardoni, P. (2019). "Risk analysis for hurricanes accounting for the effects of climate change," in Emilio Bastidas-Arteaga and Mark Stewart (Eds.), *Climate Adaptation Engineering: Risks and Economics for Infrastructure Decision-making*, Elsevier, ISBN: 978-012-81-6840-0.
5. Contento*, A., Xu, H., and Gardoni, P. (2019). "A physics-based transportable probabilistic model for climate change dependent storm surge" in Paolo Gardoni (Ed.), *Routledge Handbook of Sustainable and Resilient Infrastructure*, Routledge, ISBN: 978-113-83-0687-5.

REFEREED JOURNAL PUBLICATIONS**Note:** * Corresponding author.**Published**

1. Contento*, A., and Di Egidio, A. (2009). "Investigations into benefits of base isolation for non-symmetric rigid blocks." *Earthquake Engineering and Structural Dynamics*, 38:849-66.
2. Di Egidio, A., and Contento, A. (2009). "Base isolation of slide-rocking non-symmetric rigid blocks under impulsive and seismic excitations." *Engineering Structures*, 31:2723-34.
3. Contento*, A., Di Egidio, A., Dziedzic, J., and Tatone, A. (2009). "Modeling the contact of stiff and soft bodies with a rigid support by short-range force fields." *TASK Quarterly*, 13(1-2):155-81.
4. Ceci, A.M., Contento, A., Fanale, L., Galeota, D., Gattulli, V., Lepidi, M., and Potenza, F. (2010). "Structural performance of the historic and modern buildings of the University of L'Aquila during the seismic events of April 2009." *Engineering Structures*, 32(7):1899-1924.
5. Di Egidio, A., and Contento, A. (2010). "Seismic response of non-symmetric rigid block on a constrained oscillating base." *Engineering Structures*, 31:2723-34.
6. Zulli, D., Contento, A., and Di Egidio, A. (2012). "Three-dimensional model of rigid block with a rectangular base subject to pulse-type excitation." *International Journal of Non-Linear Mechanics*, 47(6):679-87.
7. Contento*, A., and Luongo, A. (2013). "Static and dynamic consistent perturbation analysis for nonlinear inextensible planar frames." *Computer & Structures*; 123:79-92.
8. Contento, A., and Di Egidio, A. (2014). "On the use of base isolation for the protection of rigid bodies placed on a multi-story frame under seismic excitation." *Engineering Structures*, 62-63:1-10.
9. Di Egidio, A., Zulli, D., and Contento, A. (2014). "Comparison between the seismic response of 2D and 3D models of rigid blocks." *Earthquake Engineering and Engineering Vibration*, 13:151-162.

10. Seyranian, A.P., Di Egidio, A., Contento, A., and Luongo A. (2014). "Solution to the problem of Nicolai." *Journal of Sound and Vibration*, 333:1932-1944.
11. De Leo, A.M., Contento, A., and Di Egidio, A. (2015). "Semi-analytical approach to the study of static behaviour and buckling of shells with single constant curvature." *Continuum Mechanics and Thermodynamics*, Special Issue: Nonlinearities, Bifurcation and Instabilities, 27:767-785.
12. Luongo, A., and Contento, A. (2015). "Nonlinear elastic analysis of steel planar frames under fire loads." *Computer & Structures*, 150:23-33.
13. Di Egidio, A., Alaggio, R., Contento, A., Tursini, M., and Della Loggia, E. (2015). "Experimental characterization of the overturning of three-dimensional square based rigid block." *International Journal of Non-Linear Mechanics*, 69:137-145.
14. Di Egidio, A., Contento, A., and Vestroni, F. (2015). "The role of nonlinear torsional contributions on the stability of flexural-torsional oscillations of open-cross section beams." *Journal of Sound and Vibration*, 358:236-250.
15. De Leo, A.M., Contento, A., and Di Egidio, A. (2016). "Mono-dimensional formulation of axial-symmetric spherical shells and characterization of the linear static behaviour." *Meccanica*, 51(5):1077-1092.
16. Chirivì, S., Ibell, T., Contento, A., and Di Egidio A. (2016). "Linear static behavior of curved beams coupled with strings representing also fiber-reinforced masonry arches." *Advances in Structural Engineering*, 19(1):53-64.
17. Simoneschi, G., Di Egidio, A., de Leo, A.M., and Contento, A. (2016). "On the use of reinforcing shells to improve the static behaviour of bi-dimensional structures." *Advances in Structural Engineering*, 19(8):1302-1312.
18. Gardoni, P., Guevara-Lopez, F., and Contento, A. (2016). "The Life Profitability Method (LPM): A financial approach to engineering decisions." 63:11-20.
19. De Leo, A.M., Di Egidio, A., and Contento, A. (2017). "Parametric study of the distribution of the tensile stresses in linear elastic pavilion shells." *Meccanica*, 52:2293-2305.
20. Contento*, A., Gardoni, P., Di Egidio, A., and De Leo, A.M. (2019). "Probabilistic models to assess the seismic safety of rigid block-like elements and the effectiveness of two safety devices." *Journal of Structural Engineering*, 145(11), 04019133.
21. Di Egidio, A., de Leo, A.M., and Contento, A. (2019). "The use of a pendulum dynamic mass absorber to protect a trilithic symmetric system from the overturning." *Mathematical Problems in Engineering*, Article ID 4843738:1-14.
22. Di Egidio, A., Alaggio, R., Aloisio, A., de Leo, A.M., Contento, A., and Tursini, M. (2019). "Analytical and experimental investigation into the effectiveness of a pendulum dynamic absorber to protect rigid blocks from overturning." *International Journal of Non-Linear Mechanics*, 115:1-10.
23. Di Egidio, A., Contento, A., Olivieri, C., and de Leo, A.M. (2019). "Protection from overturning of rigid block-like objects with Linear Quadratic Regulator active control," *Structural Control and Health Monitoring*, 27(10), e2598.
24. Contento*, A., Xu, H., and Gardoni, P. (2020). "Probabilistic formulation for climate change dependent predictions of storm surge," *Structure and Infrastructure Engineering*, 16(4): 547-566.
25. Di Egidio, A., Contento, A., de Leo, A.M., and Gardoni, P. (2020). "Dynamic and seismic protection of rigid-block-like elements and structures on deformable ground with mass-damper dynamic absorbers," *Journal of Engineering Mechanics*, 146(6), 04020046.

Submitted

26. Di Egidio, A., de Leo, A.M., and Contento, A. (2021). "Improvement of the rocking dynamics of cabinets by means of guided deformations," *Structural Engineering & Mechanics*.
27. Contento*, A., Di Egidio, A., and Pagliaro, S., (2021). "Dynamic and seismic protection of rigid-block-like structures with Combined Dynamic Mass Absorbers," *Engineering Structures*.

In Preparation

28. Contento, A., Pandey, A., and Gardoni, P. (2021). "Time-dependent probabilistic formulation for predictions of storm surge."
29. Nocera, F, Contento, A., and Gardoni, P. (2021). "Modeling the Resilience of Supply chains Subject to Hubs Disruptions."

OTHER PUBLICATIONS*Conference Papers*

1. Contento*, A., and Di Egidio, A. (2007). "Base isolation of non-symmetric rigid block representing monolithic objects of art." *Proceedings of the Eleventh International Conference on Civil, Structural and Environmental Engineering Computing*, St. Julian, Malta, September 18-21.
2. Contento*, A., Di Egidio, A., and Tatone, A. (2008). "Simulation of the contact among rigid surfaces by using short range force fields." *Proceedings of the Ninth International Conference on Computational Structures Technology*, Atene, Greece, September 2-5.
3. Di Egidio, A., and Contento, A. (2009). "Seismic protection of sliding-rocking non-symmetric rigid blocks through base isolation." *Proceedings of the Twelfth International Conference on Civil, Structural and Environmental Engineering Computing*, Funchal, Portugal, September 1-4.
4. Di Egidio, A., and Contento, A. (2009). "The role of the base isolation in the reduction of seismic effects on monolithic objects of art." *Proceedings of the 14th European Conference on Earthquake Engineering*, Ohrid, Republic of Macedonia, August 30 - September 03.
5. Zulli, D., Contento, A., and Di Egidio, A. (2011). "Dynamics of 3D non-symmetric rigid bodies subject to one-sine pulse excitations." *Proceedings of the Thirteenth International Conference on Civil, Structural and Environmental Engineering Computing*, Chania, Crete, Greece, September 6-9.
6. De Leo, A., Contento, A., and Di Egidio, A. (2013). "Behavior of 3D monolithic objects under seismic excitation." *Proceedings of the International Conference on Earthquake Engineering*, Skopje, Macedonia, May 29-31.
7. De Leo, A., Contento, A., and Di Egidio, A. (2013). "Static behavior of the 'long or short' barrel vaults." *Proceedings of the Fourteenth International Conference on Civil, Structural and Environmental Engineering Computing*, Cagliari, Italy, September 3-6.
8. Contento*, A., Zulli, D., and Di Egidio, A. (2013). "Overturning of 3D monolithic objects of art under seismic excitation." *Proceedings of the Fourteenth International Conference on Civil, Structural and Environmental Engineering Computing*, Cagliari, Italy, September 3-6.
9. Contento*, A., de Leo, A., and Di Egidio, A. (2014). "Mono-dimensional approximate approach to the characterization of the static behavior of spherical shells." *Proceedings of the Twelfth International Conference on Computational Structures Technology*, Naples, Italy, September 2-5.
10. Contento*, A., Chhabra, T., Gardoni, P., and Dierer, S. (2017). "Analysis of the effects of climate change on insurance against hurricanes." *Proceedings of the 12th International Conference on Structural Safety & Reliability*, Vienna, Austria, August 6-10.
11. Contento*, A., Gardoni, P., Di Egidio, A., and de Leo, A.M. (2017). "Probability models to assess the seismic safety of rigid block-like structures and the effectiveness of two safety devices." *Proceedings of the X International Conference on Structural Dynamics*, Rome, Italy, September 10-13.
12. Contento*, A., Gardoni, P., Di Egidio, A., and De Leo, A.M. (2018). "Failure probability model for coupled mass damper and rigid block-like element system on deformable soil." *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, Greece, June 18-21.
13. Contento*, A., Xu, H., Gardoni, P., and Guerrier S. (2018). "Modeling the climate change effects on storm surge with metamodels." *Proceedings of the Sixth International Symposium on Life-Cycle Civil Engineering*, Ghent, Belgium, October 28-31.
14. Di Egidio, A., Contento, A., Fabrizio, C., De Leo, A.M. (2019). "Visco-elastic coupling between a linear two-dof system and a rocking rigid block to improve the dynamic response." *Proceedings of the 13th International Conference on Recent Advances in Structural Dynamics*, ValpreLyon, France, April 15-17.

Accepted

15. Contento*, A., Boakye, J., Marucci, A., Fiorini, L., and Gardoni, P. (2021). "Modeling of the evolution of the built environment." *EUROSTRUCT 2021 - 1st Conference of the European Association on Quality Control of Bridges and Structures*, Padova, Italy, August 29-September 1.

16. Aloisio, A., Contento, A., Fragiaco, M., and Alaggio, R., (2021). "A simplified model for the reliability assessment of exist-ing concrete girders in the perspective of digital twinning." *EUROSTRUCT 2021 - 1st Conference of the European Association on Quality Control of Bridges and Structures*, Padova, Italy , August 29-September 1.
17. Di Egidio, A., Pagliaro, S., and , Contento, A., (2021), "Base versus top active control to improve dynamic and seismic performances of rigid blocks", *COMPADYN 2021 - 8th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, Streamed from Athens, Greece, June 27-30

Reports

18. Contento, A., Gattulli, V., Lepidi, M., and Potenza, F. (2006). "Identificazione di modelli per un prototipo sperimentale di telaio tridimensionale con controventi semi-attivi." Report DISAT Report No. 2/2006, Department of Civil, Environmental, and Soil Engineering, university of L'Aquila (in Italian).
19. Contento, A., and Di Egidio, A. (2011). "The use of a constrained oscillating base for the seismic protection of monolithic objects of art." CERFIS Report No. 5/2011, Centro di Formazione e Ricerca in Ingegneria Sismica, Department of Civil, Environmental, and Soil Engineering, University of L'Aquila.

INVITED LECTURES AND PRESENTATIONS

1. "Rigid blocks coupled with a pendulum mass absorber on deformable ground under impulsive excitation." Engineering Mechanics Institute Conference 2018, Cambridge, Massachusetts, USA, May 29 - June 1, 2018.
2. "Risk, Reliability Analyses and Metamodels: Examples." Department of Civil, Construction-Architectural and Environmental Engineering, University of L'Aquila, L'Aquila, Italy, October 23, 2018.
3. "Overview on research topics." Department of Architecture, The 'Gabriele d'Annunzio' University, Pescara, Italy, December 6, 2018.
4. "Prediction of storm surge evolution with time-dependent feedback." Engineering Mechanics Institute Conference 2019, Pasadena, California, USA, June 18-21, 2019.
5. "Probabilistic Formulation for Storm Surge Predictions." Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign 2019, Urbana, Illinois, USA, November 18, 2019.

TEACHING EXPERIENCE

Instructor of semester-long courses at the University of L'Aquila

Undergraduate/Graduate Course

- Complements of Structural Theory (Spring 2014)
- Introduction to Tensile Structures (Fall 2018)

Graduate Courses

- Mathematical Methods for Risk Analysis (Fall 2018)
- Mechanics of Plates and Shells (Fall 2020)

Teaching Assistant at the University of L'Aquila

Graduate Course

- Theory of Plates and Shells (Fall 2005 - Spring 2014)

Undergraduate/Graduate Course

- Structural Analysis 1 (Fall 2005 - Spring 2014)
- Structural Analysis 2 (Fall 2006 - Spring 2018)

Teaching Assistant at the University of Illinois at Urbana-Champaign

Undergraduate/Graduate Course

- Decision and Risk Analysis (Spring 2015)

STUDENT RESEARCH ADVISING*Masters**Co-advisor at the University of L'Aquila*

1. Valentina Pavone, M.S., *Modello lineare di trave curva con rinforzo in materiale composito*, completed in Fall 2012.
2. Sergio Chirivì, M.S., *Comportamento statico ed analisi parametriche di archi fibrorinforzati*, completed in Fall 2012.
3. Francesca Petrella, M.S., *Dinamica lineare nel piano e fuori dal piano dell'arco con e senza fibre di rinforzo*, completed in Fall 2012.

PROFESSIONAL SERVICE*Associate Editor*

- Mathematical Problems in Engineering (2017-Present)

Reviewer for Peer Review Journals (2005-Present)

- International Journal of Non-Linear Mechanics (Editor: P.D. Spanos)
- Earthquake Engineering and Engineering Vibration (Editors: X.Z. Qi and G.C. Lee)
- Nonlinear Dynamics (Editor: W. Lacarbonara)
- Engineering Structures (Editor: S.J. Dyke, S. Kitipornchai, G. Meschke)
- Structural Safety (Editor: M. Stewart)
- Shock and Vibration (Editor: H.-T. Thai)
- Sustainable and Resilient Infrastructure (Editor: D. Trejo)
- Structure and Infrastructure Engineering (Editor: D. Frangopol)
- ASCE Journal of Structural Engineering (Editor: J. W. van de Lindt)
- Reliability Engineering & System Safety (Editor: P. Gardoni)