

# Marco Broccardo

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## Education

- 2014 **Ph.D.**, *University of California, Berkeley, USA.*  
Ph.D. in Civil Engineering and Designated Emphasis in Computational Science and Engineering.  
**Dissertation title:** *Further Development of the Tail-Equivalent Linearization Method for Nonlinear Stochastic Dynamics.* Advisor: Armen Der Kiureghian.  
**Minor I:** *Mechanics.* Advisor: Sanjay Govindjee.  
**Minor II:** *Statistics.* Advisor: David Ross Brillinger.
- 2008 **M.S.**, *Università degli Studi di Padova, Italy.*  
M.S. in Civil Structural Engineering with the highest honors.  
**Master's thesis:** *Assumed-Deformation Gradient Finite Elements with Nodal Integration for Nearly Incompressible Large Deformation Analysis.* Advisors: Carmelo Majorana, Petr Krysl.
- 2007–08 **Exchange Student**, *University of California, San Diego, USA.*  
Department of Structural Engineering. Advisor: Petr Krysl.
- 2005 **B.S.**, *Università degli Studi di Padova, Italy.*  
B.S. in Civil-Construction Engineering with the highest honors.

## Academic Experience

- 2014-cur. **Academic Age, 9 years**, *Academic age measured from the end of the Ph.D. The first publication, in 2009, was published at the end of the master thesis, but it is not in continuity with the Ph.D. topic.*

### Research

- 2020-cur. **Associate Professor**, *University of Trento, Italy.*  
Department of Civil, Environmental, and Mechanical Engineering.
- 2021-summer **Visiting Associate Professor**, *ETH Zürich, Switzerland.*  
Visiting the Risk Center.
- 2020-Jan-Sep **Assistant Professor**, *University of Liverpool, UK.*  
Department of Civil Engineering and Industrial Design, and Institute of Risk and Uncertainty.
- 2018-2019 **Senior Researcher**, *Swiss Seismological Service, ETH Zürich, Switzerland.*  
–Main task: Development of risk and reliability frameworks for natural hazards and fluid-induced seismicity.
- 2014-2018 **Postdoctoral Researcher**, *Swiss Competence Center for Energy Research, ETH Zürich, Switzerland.*

### Teaching

- 2021-cur. **Principal instructor**, *University of Trento, Trento, Italy.*  
**Course:** Structural Reliability and Uncertainty Quantification.
- 2020-cur. **Principal instructor**, *University of Trento, Trento, Italy.*  
**Course:** Tecnica delle costruzioni con Laboratorio Progettuale.
- 2020-cur. **Instructor**, *University of Trento, Trento, Italy.*  
**Course:** Progetto di Strutture.

- 2021 **Principal instructor** , *University of Trento*, Trento, Italy.  
**Course:** Strutture Speciali.
- 2020 **Principal instructor** , *University of Liverpool*, Liverpool, UK.  
**Course:** Structural Engineering in the Built Environment.
- 2019 **Lecturer, summer school**, *Università di Trento*, Trento, Italy.  
**Course:** Primer on Data Science.
- 2016-2018 **Lecturer, Principal instructor**, *ETH Zürich*, Zürich, Switzerland.  
**Course:** Probabilistic Seismic Risk Analysis and Management of Civil Systems. Graduate class.  
 Co-developer and principal instructor of the course.
- 2018 **Lecturer, summer school**, *Università di Trento*, Trento, Italy.  
**Course:** Probabilistic Seismic Risk Analysis and Management of Civil Systems.
- 2013 **Lecturer**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 93 Engineering Data Analysis. Undergraduate class.  
 Served in the stead of the principal instructor for several lectures.
- 2013 **Graduate Student Instructor**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 93 Engineering Data Analysis. Undergraduate class.
- 2012 **Graduate Student Reader**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 226 Stochastic Structural Dynamics. Graduate class.
- 2011 **Graduate Student Instructor**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 193 Probabilistic Methods for Engineering Risk Analysis. Undergraduate class.
- 2011 **Graduate Student Instructor**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 130N Mechanics of Structures. Undergraduate class.
- 2010 **Graduate Student Instructor**, *UC Berkeley*, Berkeley, California.  
**Course:** CE 193 Probabilistic Methods for Engineering Risk Analysis. Undergraduate class.

## Student Supervision

### Doctoral Thesis, supervision & co-supervisor, *University of Trento*

- 2021-curr. **Maijia Su**. Topic: Simulation of artificial extreme ground motion events via copula multivariate models. *University of Trento*.
- 2021-curr. **Stefano Zorzi**. Topic: Bayesian Logic of Monitoring System Design. *University of Trento*.
- 2021-curr. **Güner Tugberk**. Topic: Dynamics of a Novel Seismic Material Metamaterial: Bistable Metafoundation. *University of Trento*.
- 2020-2022 **Nardin Chiara**. Topic: Markov processes for time-varying degrading processes. *University of Trento*.

### Doctoral Thesis, supervision & co-supervisor, *ETH Zürich*

- 2019-curr. **Bodenmann Lukas**. Topic: Application and comparison of financial risk measures in earthquake engineering. *ETH Zürich*.
- 2018-2022 **Xujia Zhu**. Topic: Stochastic simulator for earthquake engineering. *ETH Zürich*. (Supervised last part of his studies.)
- 2015-2019 **Max Didier**. Topic: Compositional demand/supply framework to quantify the resilience of civil infrastructure systems named Re-CoDeS. *ETH Zürich*. **Awarded with the ETH Medal for outstanding Doctoral thesis.**

### Master Thesis, supervisor (at *University of Trento*)

- 2023-curr. **Francesco Manni**. Title/topic: Multi-support seismic excitations of rocking systems. *University of Trento*.
- 2023-curr. **Nicolò Repetto**. Title/topic: Rigenerazione del waterfront del porto di Trapani. *University of Trento*.
- 2023-curr. **Nicolò Lanaro**. Title/topic: Design of the canopy structure of the city wave in Milan, Italy. *University of Trento*.

- 2023-curr. **Laura Palazzi.** Title/topic: Recupero di uno scheletro in cemento armato in disuso. University of Trento.
- 2023-curr. **Benedetta Aliprandi.** Title/topic: Riqualificazione di un forte Austro-Ungarico in territorio trentino. University of Trento.
- 2022 **Mattia Giacomozzi.** Title: Museum of snow: progettazione parametrica architettonica e strutturale attraverso la programmazione visuale, la metodologia B.I.M. e la virtual reality. University of Trento.
- 2022 **Roberto Gerussi.** Title: Probabilistic structural evaluation of a cable-suspended concrete roof: the Braga stadium (Portugal). University of Trento.
- 2022 **Francisco Fabregat Barberan.** Title: Basic structural project of a lightweight tensile fabric roof for the Valencian pilota court “Regidor Vicent Mascarell.” University of Trento.
- 2022 **Lisa Dalle Sasse.** Title: Costruire con materiali naturali locali integrando la tecnica della terra battuta con le strutture in bambu: il progetto della saponeria di Djebonoua per l’associazione Eau et Miel in Costa d’Avorio. University of Trento.
- 2021 **Nicole Piazza.** Title: Floating coast to coast: un progetto paesaggistico e ingegneristico di mobilità lenta per (ri)scoprire il lago di Caldonazzo. University of Trento.
- Master Thesis, supervisor (at ETH Zürich)**
- 2017 **Bodenmann Lukas.** Title: Application and comparison of financial risk measures in earthquake engineering. ETH Zürich. **Awarded with the Silver Medal of ETH Zürich for Outstanding Master thesis.**
- 2017 **Mathias Strand.** Statistical validation of rigid body rocking response models against experimental and numerical data. ETH Zürich.
- 2016 **Jost Christoph.** Title: Crack analysis of plastered unreinforced masonry walls under induced and triggered earthquake ground motions. ETH Zürich.
- 2016 **Luca Grimaldi.** Title: Seismic fragility analysis of a reinforced concrete highway bridge based on multiple models.
- 2015 **Florian Maier.** Title: A Framework to Quantify the Socioeconomic Resilience of Critical Infrastructure Systems Against Natural Disasters. ETH Zürich.
- 2015 **Schweikert Amelie.** Title: Reliability and Economic Resilience analysis of an integrated Urban System. ETH Zürich.

## — National & International Projects

### Current

- PRIN 2022. Principal Investigator. Project title: PREdicting Induced Seismic EVENTS with Physics-Informed Machine Learning (PREVENT). Value: 223,114 [euro]
- Revisione delle Linee Guida per la Classificazione e Gestione del Rischio, la Valutazione della Sicurezza ed il Monitoraggio dei Ponti Esistenti. Task 3: Analisi, Revisione e Aggiornamento delle Linee Guida. Specifica task: Analisi del Rapporto tra Affidabilità di Componente e di Sistema.
- Revisione delle Linee Guida per la Classificazione e Gestione del Rischio, la Valutazione della Sicurezza ed il Monitoraggio dei Ponti Esistenti. Task 3: Analisi, Revisione e Aggiornamento delle Linee Guida. Specifica task: Analisi del Rapporto tra Affidabilità di Componente e di Sistema. Role: P.I. Value: 90,000 [euro]. Founding source: RELUIS.
- SBI-COVID. Uncertainty Quantification of indirect system losses during the pandemic. Italian title: (Curva epidemica vs Business Interruptions. Appiattare o schiacciare la curva?) Role: P.I. Value: 60,000 [euro]. Founding source: Università di Trento.
- MitiGO. Mitigazione dei rischi naturali per la sicurezza e la mobilità nelle aree montane del Mezzogiorno. Role: Project Partner. Value: 701,332 [euro]. Founding source: MIUR - Ministero Istruzione Università e Ricerca.

### Past

- 3DROCK (SERA #730900 sub-project) “Statistical Validation of 3D Rocking Models,” on stochastic ground motion generation.  
Role: co-PI. Value: ≈50,000 [euro]. Founding source: Horizon 2020, European Union.
- NRP 70 National Research Program “Energy Turnaround, project P8,” on developing quasi-static testing procedures and fragility data for unreinforced masonry walls exposed to induced seismicity hazard.  
Role: co-PI. Value: ≈60,000 [euro]. Founding source: Swiss National Science Foundation (SNSF)
- COSEISMIQ: COntrol SEISmicity and Manage Induced earthQuakes. Task: Risk and Safety assessment calibrated for Icelandic conditions and extended to allow the distinction between natural and induced seismicity .  
Role: Project Partner. Value: ≈1,400,000 [euro] (total value of all packages). Founding source: European Union.
- STREST: Harmonized approach to stress tests for civil infrastructures against natural hazards (EC FP7 grant agreement no. 603389), WP5, on development of a stress test penalty system.  
Role: Project Partner. Value: ≈3,975,006 [euro] (total value of all packages). Founding source: European Union.
- DESTRESS: Demonstration of Soft Stimulation Treatments of Geothermal Reservoirs (EC grant agreement no. 691728), WP 3.2, Workflows for seismic risk assessment for soft stimulations.  
Role: Project Partner. Value: ≈10,713,408.63 [euro] (total value of all packages, only EU contribution). Founding source: European Union.

## Scholarships & Academic Awards

- 2022 **Official paper award**, at the 8th International Symposium on Reliability Engineering and Risk Management (ISRERM 22). Awarded the Ph.D. student Xujia Zhu, in a collaboration with ETH Zürich., (Certificate on request).
- 2022 **Official paper award**, at the International Conference on Structural Safety and Reliability (ICOSSAR 2021-22). Awarded the Ph.D. student Maijia Su under my supervision., (Certificate on request).
- 2020 **Top Cited Article**, [J-24], 2020-202 in Earthquake Engineering & Structural Dynamics, (Certificate on request).
- 2019 **Top downloaded Paper**, [J-10] Among top downloaded papers in 2019 in Structural Safety.
- 2019 **Top downloaded Paper**, [J-9] Among top downloaded papers in Sustainable and Resilient Infrastructure.
- 2018 **Official Paper award**, [J-5] elected as one of the Earthquake Engineering & Structural Dynamics’ top downloaded recent papers, (Certificate on request).
- 2018 **Official Paper award**, [J-7] elected as top 100 Nature Scientific Reports Earth science papers in 2017, (Certificate on request).
- 2013 **Conference scholarship**, 11<sup>th</sup> *International Conference on Structural Safety & Reliability*, Columbia University, New York.
- 2011 **Outstanding Graduate Student Instructor**, *UC Berkeley Graduate Division*, Berkeley, California, One-off eligibility.
- 2009 **Department grant**, *UC Berkeley Graduate Division*, Berkeley, California.  
Value: \$45,424.00. One out of two recipients.
- 2008 **M.S. summa cum laude with special mention on the academic curriculum**, *Università degli Studi di Padova*, Padova, Italy.
- 2008 **Exchange Abroad Program, scholarship**, *Università degli Studi di Padova*, Padova, Italy.
- 2005 **B.S. summa cum laude**, *Università degli Studi di Padova*, Padova, Italy.

## Organization of conferences

- 2019 **ICASP13**, *Member of the Scientific Committee and co-organizer of The Mini-Symposium “High-dimensional reliability analysis of complex structural systems” and of the Mini-Symposium “Simulation and validation of earthquake ground motions for engineering applications”*, International Conference on Applications of Statistics and Probability in Civil Engineering, Seoul National University, Seoul, South Korea.
- 2018 **EMI 2018**, *Mini-symposium: Monte Carlo simulation and equivalent linearization methods for nonlinear stochastic mechanical systems*, Engineering Mechanics Institute, Massachusetts Institute of Technology, MIT, Boston USA.
- 2015 **ESREL25**, *Co-organizer and member of the Scientific Committee*, European Safety and Reliability Conference, ETH Zürich.

## Invited talks & seminars (last two years)

- 2019 **Seoul National University**, *Seoul, South Korea*, Title: A Bayesian Hierarchical Framework for Induced Seismicity Hazard Associated with Deep Underground Fluid Injection.
- 2019 **California Institute of Technology (Caltech)**, *Pasadena, California*, Title: Uncertainties, Risk, and Learning in Engineering Systems.
- 2019 **University of California, Berkeley**, *Berkeley, California*, Title: Uncertainties, Risk, and Learning in Future Infrastructure Systems.
- 2018 **Università di Bologna**, *Bologna, Italy*, Title: A Bayesian Hierarchical Framework for Fluid-Induced Seismicity.

## Journal Reviewer

- Applied Mathematical Modelling.
- Bulletin of Earthquake Engineering.
- Earthquake Engineering & Structural Dynamics.
- Journal of Engineering Mechanics.
- Journal of Geotechnical and Geoenvironmental Engineering
- Journal of Pressure Vessel Technology.
- Journal of Risk and Uncertainty in Engineering Systems.
- Journal of Structural Engineering.
- Mechanical Systems and Signal Processing.
- Nature Geophysics.
- Probabilistic Engineering Mechanics.
- Structural Control and Health Monitoring

## Academic and Professional Memberships

- Earthquake Engineering Research Institute (EERI).
- Reliability and Optimization of Structural Systems (IFIP WG-7.5).
- Seismological Society of America (SSA).
- Society for Industrial and Applied Mathematics (SIAM).

## Media Coverage

- 2019 **Top Reddit Machine Learning Trend**, (*October*), One neuron versus deep learning in after-shock prediction, [link](#).
- 2019 **Top Reddit Machine Learning Trend**, (*June*), One neuron is more informative than a deep neural network for aftershock pattern forecasting (TL;DR AUC of 2 parameter model = AUC of 13,451 parameter model), [link](#).
- 2019 **Paper J15 twitter trend**, *more than 450 retweet, source: Nature*.

## Professional Experience

- 2015 External consultant as Structural Engineer and Designer at MIDE architetti Stra, Venezia.
- 2009 External consultant as Structural Engineer and Designer at OB3 Architetti (now MIDE architetti) Stra, Venezia.
- 2008-09 Structural Engineer, at CARRON s.p.a. S.Zanone degli Ezzelini, Treviso, Italy.

## Professional Awards

*In collaboration with MIDE architetti*

- 2015 Third place prize in the architectural contest: *Scuola dell'infanzia* (Primary school) Torricella, Switzerland.
- 2009 First place prize in the architectural contest: *Citta della Musica Viadana* (concert hall) Viadana, Italy.
- 2009 Second place prize in the architectural contest: *Riqualificazione centro citt  Piombino Dese* (Requalification historical city center) Piombino Dese, Italy.

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## Complete list of publications of Marco Broccardo (April 2023)

### Journal papers

- [J-34] Tugberk, G., Bursi, O., and Broccardo, M., (2023). Seismic vibration mitigation of steel storage tanks by metafoundations endowed with linear and bistable columns. Journal: *Bulletin of Earthquake Engineering*, 1–26.
- [J-33] Bodenmann, L., Broccardo, M., Galanis, P., and Stojadinovic, B. (2023). The role of risk measures in relating earthquake risks at building and portfolio levels. Journal: *Earthquake Engineering & Structural Dynamics*.
- [J-32] Zhu, X., Broccardo, M., and Sudret, B. (2023). Seismic fragility analysis using stochastic polynomial chaos expansions. Journal: *Probabilistic Engineering Mechanics*, 103413.
- [J-31] Grigoli, F., Clinton, J.F., Diehl, T., Kaestli, P., Scarabello, L., Agustsdottir, T., Kristjansdottir, S., Magnusson, R., Bean, C.J., Broccardo, M. and Cesca, S., (2022). Monitoring microseismicity of the Hengill Geothermal Field in Iceland. Journal: *Scientific Data, Nature*, 9(1), pp.1-11.
- [J-30] Chen, W., Wang, Z., Broccardo, M., and Song, J. (2022). Riemannian Manifold Hamiltonian Monte Carlo based subset simulation for reliability analysis in non-Gaussian space. Journal: *Structural Safety*.(94), 102134 DOI: 10.1016/j.strusafe.2021.102134
- [J-29] Mignan, A., Broccardo, M. and Wang, Z., (2021). Comprehensive Survey of Seismic Hazard at Geothermal Sites by a Meta-Analysis of the Underground Feedback Activation Parameter  $a_{fb}$ . Journal: *Energies*.14(23), p.7998. DOI: 10.3390/en14237998
- [J-28] Broccardo\*, M., Der Kiureghian, A. (2021). Nonlinear stochastic dynamic analysis by evolutionary tail-equivalent linearization method. Journal: *Structural Safety*.(84), 101937 DOI: 10.1016/j.strusafe.2020.102044
- [J-27] Hofmann, H., Zimmermann, G., Huenges, E., Regenspurg, S., Aldaz, S., Milkereit, C., Heimann, S., Dahm, T., Zang, A., Grigoli, F., Broccardo, M., ..., and Arnadottir, S. (2021). Soft stimulation treatment of geothermal well RV-43 to meet the growing heat demand of Reykjavik. Journal: *Geothermics*.(96), 102146 DOI: 10.1016/j.geothermics.2021.102146
- [J-26] Abbiati, G., Broccardo, M., di Filippo, R., Stojadinovic, B., and Bursi, O. S. (2021). Seismic fragility analysis of a coupled tank-piping system based on artificial ground motions and surrogate modeling. Journal: *Journal of Loss Prevention in the Process Industries*.104575. DOI: 10.1016/j.jlp.2021.104575
- [J-25] Vassiliou, M.F., Cengiz, C., Dietz, M., Dihoru, L., Broccardo, M., Mylonakis, G., Sextos, A. and Stojadinovic, B. (2020). Dataset from the shake table tests of free-standing rocking bodies. Journal: *Earthquake Spectra*.. DOI: doi.org/10.1177/87552930211020021.
- [J-24] Abbiati, G., Broccardo, M., Abdallah, I., Marelli, S., Paolacci, F. (2021). Seismic fragility analysis based on artificial ground motions and surrogate modeling of validated structural simulators. Journal: *Earthquake Engineering & Structural Dynamics*.. 1–20 DOI: https://doi.org/10.1002/eqe.3448
- [J-23] Vassiliou, M.F., Broccardo, M., Cengiz, C., Dietz, M., Dihoru, L., Gunay, S., Mosalam, K.M., Mylonakis, G., Sextos, A. and Stojadinovic, B. (2020). Shake table testing of a rocking podium: Results of a blind prediction contest. Journal: *Earthquake Engineering & Structural Dynamics*.. DOI: doi.org/10.1002/eqe.3386.
- [J-22] Wang, Z., Broccardo\*, M., Mignan, A., and Sornette, D. (2020). The dynamics of entropy in the COVID-19 outbreaks. Journal: *Nonlinear Dynamics*. 101(3), 1847-1869. DOI: doi.org/10.1007/s11071-020-05871-5
- [J-21] Vassiliou, M.F., Cengiz, C., Dietz, M., Dihoru, L., Broccardo, M., Mylonakis, G., Sextos, A. and Stojadinovic, B. (2020). Dataset from the shake table tests of a rocking podium structure. Journal: *Earthquake Spectra*.. DOI: doi.org/10.1177/8755293020988017.
- [J-20] Broccardo\*, M., Mignan, A., Grigoli, F., Karvounis, D., Rinaldi, A. P., Danciu, L., Wiemer, S. (2020). Induced seismicity risk analysis of the hydraulic stimulation of a geothermal well on Geldinganes, Iceland. Journal: *Natural Hazards and Earth System Sciences*. 20(6), 1573-1593. DOI: doi.org/10.5194/nhess-20-1573-2020.

- [J-19] Mignan, A., and Broccardo, M. (2020). Comment on “Elastic strain energy and pore-fluid pressure control of aftershocks” by Terakawa et al. [Earth Planet. Sci. Lett. 535 (2020) 116103]. Journal: *Earth and Planetary Science Letters*. 544, 116402. DOI: doi.org/10.1016/j.epsl.2020.116402.
- [J-18] Bodenmann, L., Galanis, P., Broccardo, M., and Stojadinovic, B. (2020). The role of risk measures in making seismic upgrading decisions. Journal: *Earthquake Spectra*. DOI: doi.org/10.1177/8755293020919423.
- [J-17] Mignan, A., and Broccardo, M. (2020). Neural Network Applications in Earthquake Prediction (1994–2019): Meta-Analytic and Statistical Insights on Their Limitations. Journal: *Seismological Research Letters*. 1–13 DOI: doi.org/10.1785/0220200021.
- [J-16] Wang, Z., and Broccardo\*, M. (2020). A novel active learning-based Gaussian process metamodelling strategy for estimating the full probability distribution in forward UQ analysis. Journal: *Structural Safety*. (84), 101937 (Both corresponding authors.) DOI: doi.org/10.1016/j.strusafe.2020.101937
- [J-15] Mignan, A., and Broccardo\*, M. (2019). One neuron versus deep learning in aftershock prediction. Journal: *Nature*. DOI: doi.org/10.1038/s41586-019-1582-8
- [J-14] Granello, G., Broccardo, M., Palermo, A., and Pampanin, S. (2019). Time-dependent seismic fragility curves for post-tensioned timber, Journal: *Earthquake Spectra*. DOI: doi.org/10.1177/8755293019878196.
- [J-13] Esposito, S., Stojadinovic, B., Babic, A., Dolšek, M., Iqbal, S., Selva, J., Broccardo, M., Mignan, A., and Giardini, D. (2019). A risk-based multi-level methodology to stress test critical infrastructure systems. Journal: *Journal of Infrastructure Systems*. DOI: doi.org/10.1061/(ASCE)IS.1943-555X.0000520.
- [J-12] Galanis, P., Broccardo, M., Bodenmann, L., and Stojadinović, B. (2019). Discussion of “A Framework to Evaluate the Benefit of Seismic Upgrading.” Journal: *Earthquake Spectra*. 35(3), 1511—1514. DOI: doi.org/10.1193/041219EQS086A
- [J-11] Mignan, A., Karvounis, D., Broccardo, M., Wiemer, S., and Giardini, D. (2019). Including seismic risk mitigation measures into the Levelized Cost Of Electricity in enhanced geothermal systems for optimal siting. Journal: *Applied Energy*. 238, 831–850. DOI: doi.org/10.1016/j.apenergy.2019.01.109
- [J-10] Wang, Z., Broccardo, M., and Song, J. (2018). Hamiltonian Monte Carlo methods for subset simulations in reliability analysis. Journal: *Structural Safety*. 76: 51–67. DOI: 10.1016/j.strusafe.2018.05.005
- [J-9] Didier, M., Broccardo, M., Esposito, S., and Stojadinovic, B. (2018). A compositional demand/supply framework to quantify the resilience of civil infrastructure systems (Re-CoDeS). Journal: *Sustainable and Resilient Infrastructure*. DOI: 10.1080/23789689.2017.1364560
- [J-8] Broccardo\*, M., Mignan, A., Wiemer, S., Stojadinovic, B., and Giardini, D. (2017). Hierarchical Bayesian modeling for fluid-induced seismicity. Journal: *Geophysical Research Letters*., 44. DOI: 10.1002/2017GL075251
- [J-7] Mignan, A., Broccardo, M., Wiemer, S., and Giardini D. (2017). Induced seismicity closed-form traffic light system for actuarial decision-making during deep fluid injections. Journal: *Nature Scientific Reports*. 7(1) DOI: 10.1038/s41598-017-13585-9
- [J-6] Broccardo\*, M., and Der Kiureghian, A. (2017). Simulation of stochastic processes by sinc basis functions and application in TELM analysis. Journal: *Journal of Engineering Mechanics*. DOI: 10.1061/(ASCE)EM.1943-7889.0001374
- [J-5] Bachmann J.A., Strand M., Vassiliou M. F., Broccardo M., and Stojadinovic B. (2017). Is rocking motion predictable? Journal: *Earthquake Engineering & Structural Dynamics*. DOI: 10.1002/eqe.2978
- [J-4] Vassiliou M. F., Burger S., Egger M., Bachmann J. A., Broccardo M., and Stojadinovic B. (2017). The three-dimensional behavior of inverted pendulum cylindrical structures during earthquakes. Journal: *Earthquake Engineering & Structural Dynamics*. DOI: 10.1002/eqe.2903



- [J-3] Broccardo\*, M., and Der Kiureghian, A. (2016). Multicomponent nonlinear stochastic dynamic analysis by tail-equivalent linearization. Journal: *Journal of Engineering Mechanics*, 142(3):04015100. DOI: 10.1061/(ASCE)EM.1943-7889.0001026
- [J-2] Wang, Z., Broccardo, M., and Der Kiureghian, A. (2016). An algorithm for finding a sequence of design points in reliability analysis. Journal: *Structural Safety*, (58):52–59. DOI: 10.1016/j.strusafe.2015.09.004
- [J-1] Broccardo\*, M., Micheloni, M., and Krysl, P. (2009). Assumed-deformation gradient finite elements with nodal integration for nearly incompressible large deformation analysis. Journal: *International Journal for Numerical Methods in Engineering*, 78(9):1113–1134. DOI: 10.1002/nme.2521

### Book Chapters

- [B-3] Mignan, A., and Broccardo, M. (2019). A Deeper Look into “Deep Learning of Aftershock Patterns Following Large Earthquakes:” Illustrating First Principles in Neural Network Physical Interpretability. In *International Work-Conference on Artificial Neural Networks* (pp. 3-14). Springer, Cham.
- [B-2] Mignan A., Broccardo M., Wiemer S., Giardini D. (2018) Autonomous Decision-Making Against Induced Seismicity in Deep Fluid Injections. Book: *In: Ferrari A., Laloui L. (eds) Energy Geotechnics. SEG 2018. Springer Series in Geomechanics and Geoengineering*. Springer, Cham
- [B-1] Broccardo, M., Alibrandi, U., Wang, Z., and Garrara, L. (2016). The tail-equivalent linearization method for nonlinear stochastic processes, genesis and developments. Book: *In Risk and Reliability Analysis: Theory and Applications (pp. 109-142)*. Springer International Publishing.

### Conference Proceedings

- [C-31] Zhu, X., Broccardo, M. and Sudret, B., (2022). Use of generalized lambda models for seismic fragility analysis. In *Proc. 8th Int. Symp. on Reliability Engineering and Risk Management (ISRERM)*, Hannover (Germany) September 4-7.
- [C-30] Su, M., Broccardo, M. and Wang, Z., (2022). A comparative study on the active learning based metamodeling methods for full probability distribution estimation. In *Proc. ICOSSAR 2021-2022, 13th International Conference on Structural Safety & Reliability*, 13-17 September 2022, Tongji University, Shanghai, China.
- [C-29] Vassiliou, M.F., Broccardo, M., Cengiz, C., Dietz, M., Dihoru, L., Gunay, S., Mosalam, K.M., Mylonakis, G., Sextos, A. and Stojadinovic, B., (2021). 3D rocking motion: Blind prediction contest results and influence of evaluation metric on the rankings. In *COMPdyn 2021: 8th EC-COMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*. National Technical University of Athens (NTUA).
- [C-28] Vassiliou, M.F., Broccardo, M., Cengiz, C., Dietz, M., Dihoru, L., Gunay, S., Mosalam, K.M., Mylonakis, G., Sextos, A. and Stojadinovic, B., (2021). CBlind Prediction Contest on the Shake Table Tests of a 3D Rocking Structure. In *17th World Conference on Earthquake Engineering (WCEE 2020-21)*.
- [C-27] Bodenmann, L., Galanis, P., Broccardo, M. and Stojadinovic, B., (2021). Comparison of different risk measures for portfolio-level earthquake risk assessment. In *17th World Conference on Earthquake Engineering (WCEE 2020-21)* (pp. 8c-0057).
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