

# Marco Broccardo

Associate Professor, University of Trento

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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 obtained in the program of *Structural Engineering, Mechanics and Materials (SEMM program)*.  
**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

### Official Academic Positions

- 2020-cur. **Associate Professor**, *University of Trento, Italy.*  
Department of Civil, Environmental, and Mechanical Engineering.
- 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.
- 2015-2018 **Postdoctoral Researcher**, *Swiss Competence Center for Energy Research, ETH Zürich, Switzerland.*

### Visiting Academic Positions

- 2021-summer **Visiting Position**, *ETH Zürich, Risk Center, Switzerland.*  
Invitation by Prof. Bozidar Stojadinovic.

### Teaching at University of Trento

- 2024-cur. **Principal instructor**, *University of Trento, Trento, Italy.*  
**Course:** Risk Analysis and Structural Reliability. Civil Engineering.
- 2020-cur. **Principal instructor**, *University of Trento, Trento, Italy.*  
**Course:** Structural Design (Steel and Reinforced Concrete Design). Architecture Engineering.
- 2024-cur. **Instructor**, *University of Trento, Trento, Italy.*  
**Course:** Earthquake Engineering. Civil Engineering.

- 2020-cur. **Instructor**, *University of Trento*, Trento, Italy.  
**Course:** Design of Structure. Architecture Engineering.
- 2022-cur **Principal instructor** , *University of Trento*, Trento, Italy.  
**Phd. Course:** Machine Learning & AI Methods Theory, Techniques, and Advanced Engineering Applications.
- 2021-2023 **Principal instructor** , *University of Trento*, Trento, Italy.  
**Course:** Structural Reliability and Uncertainty Quantification. Civil Engineering.
- 2021 **Principal instructor** , *University of Trento*, Trento, Italy.  
**Course:** Strutture Speciali (Special Structures). Civil Engineering.
- 2019 **Lecturer, summer school at the Department of Mathematics**, *Università di Trento*, Trento, Italy.  
**Course:** Primer on Data Science.
- 2018 **Lecturer, summer school**, *Università di Trento*, Trento, Italy.  
**Course:** Probabilistic Seismic Risk Analysis and Management of Civil Systems.

### Teaching at former Institutions

- 2020 **Principal instructor** , *University of Liverpool*, Liverpool, UK.  
**Course:** Structural Engineering in the Built Environment.
- 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.
- 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.
- 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.

## International & National Projects

### Current International and National Research Projects on competitive bases (Principal Investigator)

- GEOTWIN: Digital Twin Components for Deep Geothermal Energy Power and Heat Generation. CET Partnership, Joint Call 2023.  
 Role: Principal Investigator, UniTN unit. Total Value:  $\approx 4,000,000$  [euro] (total value of all packages) ETH Zürich Coordinator. UniTN funds:  $\approx 530,000$  [euro] of which 215,000 co-financed.
- PRIN 2022. PREVENT Project title: *PREdicting Induced Seismic EVENTS with Physics-Informed Machine Learning*.  
 Role: Principal Investigator and Coordinator. Total Value: 223,114 [euro]. Founding source: Miur: Ministero dell'Istruzione e del Merito.
- HORIZON-MSCA-2023-PF-01, REACTIS. Project title: *Seismic Risk Reduction and Adaptation for Complex Time-Dependent Industrial Systems*. PI of the Post-Doctoral Student awarded (Chiara Nardin).  
 Role: Principal Advisor and Coordinator. Total Value: 297,164 [euro]. Founding source: MSCA Postdoctoral Fellowships - Global Fellowships.
- Pacific Earthquake Engineering Research Center (PEER) California Transportation Systems Research Program (TSRP 22-01). Project title: *Stochastic Simulator-based Uncertainty Quantification for Seismic Responses of Bridges*.

Role: Co-Principal Investigator. Total Value: 50,000 [\$]. Founding source: Pacific Earthquake Engineering Research Center.

- ADEPT: Adaptive Temporal-Spatial Design of Experiments for Optimal Assessment of Reinforced and Prestressed Concrete Structural Degradation. Programma PE RETURN – Multi Risk science for resilient communities under a changing climate – PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR). NextGenerationEU.

Role: Principal Investigator. Total Value: 119,668.75 [euro]. Founding source, Italian side: PNRR NextGenerationEU.

- Revision of the Guidelines for Classification and Risk Management, Safety Assessment, and Monitoring of Existing Bridges. Task 3: Analysis, Review, and Update of the Guidelines. Specific Task: Analysis of the Relationship between Component and System Reliability.

Role: Principal Investigator. Total Unit 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: Principal Investigator. Value: 60,000 [euro]. Founding source: University of Trento.

### Current (Project involvement as UniTN Unit Partner)

- BEYOND – Beyond hyperelasticity: a virgin land of extreme materials.

Role: UniTN Project Partner. Founding source: Prof. Bigoni's Advanced European Research Council (ERC) funds.

- S-FOAM – Self-Foldable Origami-Architected Metamaterials: S-FOAM.

Role: UniTN Project Partner. Founding source: Prof. Misseroni's Consolidator European Research Council (ERC) funds.

### Past Projects

- 3DROCK (SERA #730900 sub-project) "Statistical Validation of 3D Rocking Models," on stochastic ground motion generation.

Role: co-PI. Value:  $\approx 50,000$  [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:  $\approx 60,000$  [euro]. Founding source: Swiss National Science Foundation (SNSF).

## Scholarships & Academic Awards

- 2024 **Official Paper Award**, First-Class Best Student Paper Award at the latest ICVRAM-ISUMA conference, Tongji University, Shanghai, China. Awarded the Ph.D. student Maijia Su under my supervision, (Certificate on request).
- 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 **Official Paper Award**, The article "Seismic fragility analysis based on artificial ground motions and surrogate modeling of validated structural simulators" has been among the top cited papers in Earthquake Engineering & Structural Dynamics in 2020-21, (Certificate on request).
- 2018 **Official Paper Award**, The article "Is rocking motion predictable?" has been among the top cited papers in Earthquake Engineering & Structural Dynamics in 2017-18. Amongst articles published between January 2017 and December 2018, this paper received some of the most downloads in the 12 months following online publication, (Certificate on request).

- 2018 **Official Paper Award**, “Induced seismicity closed-form traffic light system for actuarial decision-making during deep fluid injections” has been selected as one of the top 100 read Earth Sciences papers for Scientific Reports in 2017. The Journal publishes more than 1500 papers per year, (Certificate on request).
- 2013 **Conference scholarship & best conference paper award**, 11<sup>th</sup> *International Conference on Structural Safety & Reliability*, Columbia University, New York, Student travel fellowship. Value 300[\$], awarded to students with best papers. Conference paper title: Non-stationary stochastic dynamic analysis by tail-equivalent linearization.
- 2011 **Outstanding Graduate Student Instructor. Structural Engineering, Mechanics and Materials Ph.D. program.**, *UC Berkeley Graduate Division*, Berkeley, California, One-off eligibility.
- 2009 **UC Berkeley Departmental Grant**, *UC Berkeley Graduate Division*, Berkeley, California. Value: \$45,424.00. Fellowship award to be admitted into the Structural Engineering, Mechanics and Materials Ph.D. program. **Two recipients out of 1,154 applicants.**
- 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.

### Conference organization

- 2024 **IFIP21**, *Member of the Scientific Committee and co-organizer of of the 21st Working Conference of the IFIP Working Group 7.5 on Reliability and Optimization of Structural Systems, 19-08/21-08-2024*, University of California, Berkeley.
- 2024 **WCEE 2024**, *Organizer of of the Mini-Symposium “Uncertainty quantification and reliability methods for regional seismic risk assessment”*, World Conference on Earthquake Engineering 2024, Milan.
- 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.

### Editing or serving on editorial boards of journals, publishing series, and treatises of recognized prestige

- Scientific committee of “Risk and Reliability Analysis: Theory and Applications - In Honor of Prof. Armen Der Kiureghian.” Editor: Professor Paolo Gardoni. Book that collects contribution from previous Ph.D. students and collaborators of Prof. Armen Der Kiureghian.

### Academic Service, selected

- Member of the Faculty Board of the PhD Program in Civil, Environmental, and Mechanical Engineering at the University of Trento starting from January 20, 2021.
- Coordinator of the Honours Programme “Advanced Methods in Engineering.” A program for outstanding master’s students aimed at preparing them for a doctoral career. Reserved for 2/3 students with a final certificate.
- Principal presenter in the orientation program of the Department of Civil, Environmental, and Mechanical Engineering at the University of Trento.

## International Invited talks & seminars, selected

- 2024 **Tongji University**, Title: Surrogate Modeling for Full Probability Estimation: Uniform or Active Learning Design.
- 2024 **New York University, Abu Dhabi**, Title: Hamiltonian Monte Carlo-Subset Simulation (HMC-SS) methods for rare event probability estimation.
- 2023 **Università di Padova, Padova, Italy**, Title: Probabilistic Seismic Risk Analysis.
- 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 Safety.
- Structural Control and Health Monitoring

## Student Supervision

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

- 2023-curr. **Ozge Ulker**. Topic: Reliability Based Optimization of Metamaterials and Metastructures. 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.
- 2021-2024 **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, guidance, ETH Zürich

- 2019-2023 **Bodenmann Lukas**. Topic: Application and comparison of financial risk measures in earthquake engineering. ETH Zürich.
- 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. Selected.

- 2024 **Tommaso Rossi**. Title/topic: Spazi dimenticati: rigenerazione del complesso industriale abbandonato dell'ex zuccherificio eridania di codigoro (FE). University of Trento.
- 2024 **Laura Palazzi**. Title/topic: Ripensare l'incompiuto. riciclo architettonico e recupero strutturale di uno scheletro portante in c.a. sito in Pesaro. University of Trento.
- 2024 **Nicolò Repetto**. Title/topic: Rigenerazione del waterfront portuale di Trapani. University of Trento.
- 2023 **Francesco Manni**. Title/topic: Multi-support seismic excitations of rocking systems. University of Trento.
- 2023 **Alessio Rimoldi**. Title/topic: Data-enabled predictive control for sustainable traffic optimization: a case study of Zürich network with reduced co2 emissions. University of Trento.
- 2023 **Nicolò Lanaro**. Title/topic: Design of the canopy structure of the city wave in Milan, Italy. 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. ETH Zürich.
- 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.

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### 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.**

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### Professional Experience

- 2023 External consultant as Structural Engineer and Designer at MIDE architetti Stra, Venezia.
- 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 città Piombino Dese* (Requalification historical city center) Piombino Dese, Italy.



## Complete list of publications of Marco Broccardo (November 2024)

### Introduction

Currently, I have authored over 65 peer-reviewed publications, including 37 journal articles (not counting accepted but yet-to-be-published papers), three book chapters, and more than 30 conference proceedings. Of the 37 journal articles, four were co-authored with my Ph.D. advisor, constituting 11% of my journal publications and underscoring my academic independence. I prioritize quality in my publications, aiming for a balanced ratio of high-impact contributions (e.g., in *Nature*) and highly technical studies. Below is the complete list of publications, where an asterisk (\*) denotes either first author or corresponding author.

### Journal papers

- [J-37]\* Wang, Z., Song, J., and Broccardo, M. (2024). Probabilistic Performance-Pattern Decomposition (PPPD): Analysis framework and applications to stochastic mechanical systems. Journal: *Reliability Engineering & System Safety*, 252, 110459.
- [J-36]\* Zorzi, S., Broccardo, M., Tonelli, D., and Zonta, D. (2024). Reliability-based metrics for structural health monitoring information quality assessment. Journal: *Structural Health Monitoring*.
- [J-35]\* Su, M., Dabaghi, M., and Broccardo, M., (2024). The importance of corner frequency in site-based stochastic ground motion models. Journal: *Earthquake Engineering & Structural Dynamics*.
- [J-34] Tugberk, G., Bursi, O., and Broccardo, M., (2024). 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](https://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](https://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](https://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](https://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](https://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](https://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](https://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 DOI: [doi.org/10.1016/j.strusafe.2020.101937](https://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](https://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](https://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](https://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](https://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](https://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](https://doi.org/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
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- 2022 A comparative study on the active learning-based metamodeling methods for full probability distribution estimation. *13th International Conference on Structural Safety and Reliability (ICOSSAR 2021)* June 21-25, Shanghai, P.R. China, 2022.
- 2021 Comparison of different risk measures for portfolio-level earthquake risk assessment. *17th World Conference on Earthquake Engineering (WCEE 2020-21)* Online due to COVID pandemic. Sendai Japan 2020-21.
- 2019 Preliminary Validation of a Spectral-Based Stochastic Ground Motion Model with a Non-Parametric Time-Modulating Function (ICASP13) *International Conference on Applications of Statistics and Probability in Civil Engineering Seoul May 26-30 2019.*
- 2018 Hamiltonian Monte Carlo based Subset Simulation using Surrogate Models. *19th IFIP WG7.5.* ETH Zürich, Switzerland.
- 2018 Hamiltonian Monte Carlo Subset Simulation (HMC-SS) Method for Failure Probabilities and Rare Events Estimation in Non-Gaussian Spaces. *Engineering Mechanics Institute Conference (EMI 2018)* MIT, Cambridge, MA, USA.
- 2018 Hamiltonian Monte Carlo-subset Simulation (HMC-SS) method for structural reliability analysis: theory and applications. *SIAM: SIAM Conference on Uncertainty Quantification (UQ18)* Los Angeles
- 2018 Hamiltonian Monte Carlo Subset Simulation (HMC-SS) Method for Failure Probabilities and Rare Events Estimation in Non-Gaussian Spaces. *SIAM: SIAM Conference on Uncertainty Quantification (UQ18)* Los Angeles
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- 2017 A spectral-based stochastic ground motion model with a non-parametric time-modulating function. *12th International Conference on Structural Safety & Reliability (ICOSSAR)*, Vienna.
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- 2016 Use and validity of the PEER-PBEE for probabilistic resilience assessment of structural system. *International Symposium on Sustainability and Resiliency of Infrastructure*, Taipei, Taiwan.

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- 2014 Simulation of near-fault ground motion using frequency-domain discretization *10th U.S. National Conference on Earthquake Engineering*, Anchorage, Alaska.
- 2013 Multicomponent nonlinear stochastic dynamic analysis using tail-equivalent linearization and application to a base-isolated structure. *Conference of the ASCE Engineering Mechanics Institute EMI*, Northwestern University, Evanston, Illinois.
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