

Curriculum Vitae - Peihua Ni

Research Fellow (09/2025-present)

Department of Structural and Geotechnical Engineering, Sapienza University of Rome

Research Interests

- Uncertainty Quantification
- Stochastic Dynamics and Nonlinear Systems
- Stochastic and Fractional Calculus

Professional Experience

Research Fellow (01/2024-04/2025)

College of Design and Engineering, National University of Singapore, Singapore

Postdoctoral Fellow (08/2023 - 12/2023)

Institute for Risk and Reliability, Leibniz Universität Hannover, Germany

Research Assistant & Graduate Teaching Assistant (03/2019 - 08/2023)

Institute for Risk and Reliability, Leibniz Universität Hannover, Germany

Structural Engineer (10/2016 - 02/2019)

Shanghai Urban Construction Design & Research Institute, China

Education

Doctor of Philosophy, “Ausgezeichnet (Excellent)” (08/2023)

Faculty of Civil Engineering and Geodetic Science, Leibniz Universität Hannover, Germany

Thesis title “*Response Statistics and Failure Probability Determination of Nonlinear Stochastic Structural Dynamical Systems*”

Supervisors: Michael Beer, Professor, Leibniz Universität Hannover, Germany

Ioannis Mitseas, Assistant Professor, University of Leeds, UK

Master of Science (Ranking 3/28) (09/2013 - 06/2016)

Faculty of Infrastructure Engineering, Dalian University of Technology, China

Thesis title “*The Wind-Resistant Research of Torsional Visco-elastic Damper on the Rural Wood Structure*”

Supervisor: Hongnan Li, Yangtze river scholars Distinguished Professor, National science for distinguished young scholars

Dalian University of Technology, China

Bachelor (Ranking 8/225) (09/2008 - 06/2012)

Department of Civil Engineering, Tianjin Chengjian University, China

Honors/Awards

Best Student Paper Award

Awarded by the International Association for structural Safety and Reliability (IASSAR) awards committee

ICOSSAR 2021-2022 Conference, First Class Award

Finalist of the Engineering Mechanics Institute Conference (EMI 2022) Student Paper Competition

Dynamics Committee, Engineering Mechanics Institute (EMI) Conference 2022

Certificate of appreciation for invited talk (coauthor)

The 4th International Conference on Vulnerability and Risk Analysis and Management (ICVRAM2024) and the 8th International Symposium on Uncertainty Modelling and Analysis (ISUMA2024)

Postgraduate Research Studentship (03/2019 – 08/2023)

Institute for Risk and Reliability, Leibniz Universität Hannover (maintenance and tuition fees)

Research Projects

“*Hybrid physics-guided and data-driven attribution and uncertainty quantification of coastal extremes incorporating different sources of information*”, Researcher (01/2024 – 04/2025)

Peihua Ni
National University of Singapore

Funding agency: PUB Singapore Research

“Nonlinear random vibration analysis methods for the design of dynamic MDOF structural systems subject to seismic hazard”, Researcher (01/2019 - 04/2023)

Funding agency: German Research Foundation (DFG), [Grant No. BE 2570/7-1 & MI 2459/1-1](#)

“Bayesian inference and updating for reliability analysis of complex systems under incomplete knowledge”, Researcher (01/2021 - 12/2023)

Funding agency: Sino-German Center for Research Promotion, [Grant No. M-0175](#)

“Research on Key Technologies of Wind Resistance and Control of Rural Buildings in Typhoon-prone Areas”, Researcher, (10/2014 - 12/2017)

Funding agency: Chinese Ministry of Science and Technology, Grant No. 2014BAL05B03

Teaching Experience (Leibniz Universität Hannover, 2021 - 2023)

Advanced Stochastic Analysis, Graduate module (**Coordinator**) for M.Sc. Computational Methods in Engineering

Foundations of Computational Engineering, Graduate module for M.Sc. Computational Methods in Engineering

Stochastics for Engineers, Undergraduate module

Academic services

Reviewer - International peer-reviewed Journals

Mechanical Systems and Signal Processing (TOP)

Reliability Engineering & System Safety (TOP)

ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems (Part A, Part B)

Seminars

Department of Engineering Mechanics, Dalian University of Technology (06/2023)

Department of Civil Engineering, Hefei University of Technology, China (01/2022)

School of power and energy, Northwestern polytechnical university, China (12/2021)

The 1st Sino-German Workshop on Reliability of Complex Systems, Xi'an, China (11/2021)

Visiting scholar positions

Sino-German mobility program *“Bayesian inference and updating for reliability analysis of complex systems under incomplete knowledge”* Grant number: M-0175

School of Mechanics, civil Engineering and Architecture, Northwestern Polytechnical University, Xi'an, China (11/2021 – 01/2022)

School of Civil Engineering, Tongji University, China (01.2022)

Department of Civil Engineering, Hefei University of Technology, China (01.2022)

Memberships

Student member of the American Society of Civil Engineers (ASCE)

Engineering Mechanics Institute (EMI)

Society for Industrial and Applied Mathematics (SIAM)

Technical Skills

IT programming language: Matlab, Julia, Python, R, Fortran, C

Professional Software: SAP2000, ETABS, ANSYS, PKPM, CAD, XBeach

Industrial Skills

As a structural engineer (2016-2019), I have contributed to over 30 major infrastructure projects, including riverbank reinforcements, sewage treatment plants, comprehensive corridors, and tunnels. My expertise spans structural design, project management, and ensuring compliance with safety and codes.

Ph.D. Dissertation

Ni, Peihua. "Response statistics and failure probability determination of nonlinear stochastic structural dynamical systems." (2023).

Peer-Reviewed International Journals (Papers)

- A1. Ni, P., Mitseas, I. P., Fragkoulis, V. C., & Beer, M. (2024). Spectral incremental dynamic methodology for nonlinear structural systems endowed with fractional derivative elements subjected to fully non-stationary stochastic excitation. [Structural Safety](#), 102525.
- A2. Mitseas, I. P., Ni, P., Fragkoulis, V. C., & Beer, M. (2024). Survival probability surfaces of hysteretic fractional order structures exposed to non-stationary code-compliant stochastic seismic excitation. [Engineering Structures](#), 318, 118755.
- A3. Ni P., Fragkoulis V.C., Kong, F., Mitseas I.P., & Beer, M., 2023. Non-stationary response of nonlinear systems with singular parameter matrices subject to combined deterministic and stochastic excitation. [Mechanical Systems and Signal Processing](#), 188, 110009.
- A4. Kougioumtzoglou, I.A., Ni, P., Mitseas, I.P., Fragkoulis, V.C., & Beer, M., 2022. An approximate stochastic dynamics approach for design spectrum based response analysis of nonlinear structural systems with fractional derivative elements. [International Journal of Non-Linear Mechanics](#), 146, 104178.
- A5. Ni P., Jerez D.J., Fragkoulis V.C., Faes M.G.R., Valdebenito M.A., Beer M., 2022. Operator norm-based statistical linearization to bound the first excursion probability of nonlinear structures subjected to imprecise stochastic loading, [ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering](#). 8(1), 04021086.
- A6. Ni P., Fragkoulis V.C., Kong F., Mitseas I.P., Beer M., 2021. Response determination of nonlinear systems with singular matrices subject to combined stochastic and deterministic excitations, [ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering](#), 7(4), 04021049: 1-11.
- A7. Jerez, D. J., Fragkoulis, V. C., Ni, P., Mitseas, I. P., Valdebenito, M. A., Faes, M. G., & Beer, M. (2024). Operator norm-based determination of failure probability of nonlinear oscillators with fractional derivative elements subject to imprecise stationary Gaussian loads. [Mechanical Systems and Signal Processing](#), 208, 111043.

Peer-Reviewed Conference Proceedings (Papers)

- D1. Ni P., Mitseas I.P., Fragkoulis V.C., Beer M., Stochastic incremental dynamics methodology for nonlinear structural systems endowed with fractional derivative terms subjected to code-compliant seismic excitation, In: *Proceedings of the 14th International Conference on Application of Statistics and Probability in Civil Engineering (ICASP 14)*, Trinity College Dublin, Ireland, July 9 - 13, 2023.
- D2. Ni P., Jerez D.J., Fragkoulis V.C., Mitseas I.P., Faes M.G.R., Valdebenito M.A., Beer M., Probability of failure of nonlinear oscillators with fractional derivative elements subject to imprecise Gaussian loads, In *Journal of Physics: Conference Series*. IOP. ([EURODYN 2023](#)), Delft, The Netherlands, July 02 - 15, 2023.
- D3. Ni P., Fragkoulis V.C., Kong F., Mitseas I.P., Beer M., Response of an MDOF nonlinear system with constraints under combined deterministic and non-stationary stochastic excitation. In: *Proceedings of the 8th International Symposium on Reliability Engineering and Risk Management (ISRERM)*, Hannover, Germany, September 4-7, 2022, Leibniz Universität Hannover, Hannover, Germany.

- D4. **Ni P.**, Fragkoulis V.C., Kong F., Mitseas I.P., Beer M. Response determination of a nonlinear energy harvesting device under combined stochastic and deterministic loads. In: *Proceedings of the 13th International Conference On Structural Safety And Reliability (ICOSSAR 2021-2022)*, June 20-24, 2022, Tongji University, Shanghai, China.
- D5. **Ni P.**, Fragkoulis V.C., Kong F., Mitseas I.P., Beer M., Equivalent statistical quadratization based response analysis for nonlinear oscillators with fractional derivative terms, In: *Proceedings of the 14th International Conference on Computational Structures Technology (CST 2022)*, 23-25 August, 2022, Montpellier, France.
- D6. Mitseas I.P., **Ni P.**, Fragkoulis V.C., Kong F., Beer M., Fragiadakis M. Stochastic nonlinear response of structural systems endowed with singular matrices subject to combined periodic and stochastic excitations. In: *Proceedings of the 8th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2021)*, Athens, Greece, June 27-30, 2021.

Peer-Reviewed Conferences (Abstracts)

- D7. **Ni P.**, Fragkoulis V.C., Mitseas I. P., Kong F., Beer M., Stochastic Response Analysis of Nonlinear Fractional Oscillators: A statistical quadratization-based Perspective, In: *Proceedings of the 4th International conference Vulnerability and Risk Analysis and Management (ICVRAM 2024) & the 8th International Symposium on Uncertainty Modeling and Analysis (ISUMA 2024)*, Shanghai, China, April 25 - 28, 2024.
- D8. **Ni P.**, Mitseas I.P., Fragkoulis V.C., Beer M., First-passage stochastic incremental dynamics methodology for nonlinear systems with fractional derivative elements, In: *Proceedings of Engineering mechanics institute conference 2023 (EMI 2022)*, Atlanta, USA, June 6 - 9, 2023.
- D9. **Ni P.**, Kougioumtzoglou I.A., Mitseas I.P., Fragkoulis V.C., Beer M., Stochastic dynamics framework for nonlinear oscillators endowed with fractional derivative elements under compatible design-spectrum seismic excitation, *Proceedings of the International Conference on Nonlinear Solid Mechanics (ICONSUM 2022)*, Alghero, Sardinia, Italy, June 13 - 16, 2022.
- D10. Faes M.G.R., Fragkoulis V.C., **Ni P.**, Valdebenito M.A., Jerez D., Beer M. Breaking the double loop in nonlinear dynamic reliability analysis under epistemic uncertainty. In: *Proceedings of the 8th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2021)*, Athens, Greece, June 27-30, 2021.
- D11. **Ni P.**, Mitseas I.P., Fragkoulis V.C., Kougioumtzoglou I.A., Beer M. Peak response determination of nonlinear oscillators with fractional derivative elements under code-compliant stochastic seismic excitations. In: *XI International Conference on Structural Dynamics (EURODYN 2020)*, November 23-26, 2020, Athens, Greece.
- D12. **Ni P.**, Mitseas I.P., Beer M. (2019): An approximate stochastic dynamics framework for inelastic response determination of hysteretic MDOF structural systems subject to code-compliant non-stationary stochastic seismic excitation, *Proceedings of the 16th International Conference on Civil, Structural and Environmental Engineering Computing (CIVIL-COMP 2019)*, Lake Garda, Italy, September 16-19, 2019.