

Dr. Maria Nogal

Faculty of Civil Engineering and Geosciences
Delft University of Technology (Netherlands)
☎ +31 (0) 1527 81829
✉ m.nogal@tudelft.nl

Professional history

Academic and industrial appointments

- Since 2019 **Associate Professor** at Dept of Materials, Mechanics, Management & Design, Faculty of Civil Engineering and Geosciences, TU Delft (Netherlands)
- Since 2019 **Adjunct Assistant Professor** at Dept of Civil, Structural & Environmental Engineering, School of Engineering. Trinity College Dublin (Ireland)
- 2021-2025 **Visiting Lecturer** at the School of Civil Engineering, Faculty of Civil Engineering and Geosciences. University College Dublin (Ireland)
- 2017-2019 **Assistant Professor in Construction Innovation & Principal Investigator of TrinityHaus**, Dept of Civil, Structural & Environmental Engineering, School of Engineering. Trinity College Dublin (Ireland)
- 2014-2017 **Research Fellow**, Dept of Civil, Structural & Environmental Engineering, School of Engineering, Trinity College Dublin (Ireland)
- 2010-2014 **PhD Researcher**, Dept of Applied Mathematics & Computational Science, Faculty of Civil Engineering, University of Cantabria (Spain)

Visiting appointments

- 2025-11 **Visiting Academic** at the Division of Structural Engineering at Lund University (Sweden)
- 2024-03 **Visiting Academic** at the School of Civil & Environmental Engineering, University of Technology Sydney (Australia)
- 2023-2&3 **Guest Professor** at the Institute for Construction and Infrastructure Management. ETHZ (Switzerland)
- 2016-3&4 **Visiting Research Fellow** at the Dept of Hydraulic Engineering, TU Delft

Education

- 2010-2012 **PhD in Civil Engineering** on *Mathematical methods for traffic prediction* (Cum Laude), Dept of Applied Mathematics & Computation Sciences. University of Cantabria (Spain)
- 2009-2010 **MRes in Civil Engineering**, Faculty of Civil Engineering, University of Cantabria
- 2002-2004 **MSc Civil Engineering**, Faculty of Civil Engineering, University of Cantabria (Spain). Structural Expert
- 1997-2002 **BSc Civil Engineering**, Faculty of Civil Engineering, University of Cantabria (Spain)

Funding and grants

Competitive grants (PI / Co-PI)

- 2026-2027 INFERNO-RES. Infrastructure and Industrial Resilience to Wildfire, Fire and Blast with AI. **TUD Safety and Security Institute Strategic funding**
- 2026-2027 Security & Resilience for society. Civil protection via infrastructure inspection and monitoring. **TUD Safety and Security Institute Seed funding**
- 2026-2029 SHIELD: Safety and multi Hazard Identification for resilient European hydrogen infrastructure and Logistics Development. **HORIZON-TMA-MSCA-SE-2024**
- 2025-2027 ALARM. Acquired social LeArning Risk Management. **Pandemic & Disaster Preparedness Center**
- 2025 Developing an open interactive book for Agent-based modelling using python. **Open Education Stimulation Fund 2024**
- 2024-2028 FOURIER: InnOvative ArtiFicial Intelligence methodologIes for monitoRing and maintaining large-scale complex infrastrUctures and obtaining greener, more Resilient and smart societies. **HORIZON-MSCA-2022**

- 2024-2027 ResilientHydroTwin: Participatory integrated Digital Twin for adaptive urban resilience to water extremities **NWO. Merian Fund Water Disaster Management 2023**
- 2024-2027 REGENERATE: Reliable nExt GENERation Actuation sysTEms. **NWO – Next Generation High-Tech Equipment**
- 2023 Cooking up Open Education Resources for the resilience engineering community. **Open Education Stimulation Fund 2022**
- 2022-2029 Collaborative Doctoral Partnership on Resilience of built infrastructure to natural and man-made hazards. **European Joint Research Center**
- 2021 An Exploratory Study on Process Safety and Asset Integrity Management in the Digital Age. **Seed Funding from TU Delft Safety and Security Institute**
- 2021-2024 JOIN-RISe: Joint development of innovative blended learning in STEM curricula based on SDGs for a resilient, inclusive and sustainable education. **KA220-HED - 2021 (Erasmus+ Program)**
- 2020-2021 Digital competence support to develop MitC Graphical User Interface and online repository. **TU Delft Digital Competence Centre (DCC)**

Collaborative projects and consortia

- 2026-2028 Urban HealthTwin: A participatory digital twin to investigate the effects of Nature-Based Solutions on climate change-induced urban health challenges. **Merian Fund Cooperation Brazil-The Netherlands (FAPESP) Extreme Heat and Water Events 2024**
- 2025-2028 REUNATECH: NaTech risk management and resilience of high-tech industries and critical infrastructures across Europe. **HORIZON-MSCA-DN-2024**
- 2023-2027 APRIORI: Active PRoduct-to-Process LearnIng fOR Improving Critical Components Performance. **HORIZON-MSCA-2021**
- 2022-2025 Machine Learning Alarm Systems for BIM digital twin bridge maintenance. **Spanish Ministry of Science and Innovation**
- 2022-2025 Development of low-cost modular sensors for structural system identification of bridges subjected to quasi-static loads. **Spanish Ministry of Science and Innovation.**
- 2018-2021 Structural models for the efficient infrastructure management: smart BIM models. **Spanish Ministry of Economy and Finance**
- 2018-2021 Calibration of BIM models using low-cost sensors for energy optimization of buildings. **Spanish Ministry of Economy and Finance**
- 2016-2017 Expert Judgment Network: Bridging the Gap Between Scientific Uncertainty and Evidence-Based Decision Making. **ISCH COST Action IS1304**
- 2015-2018 TRUST: Training in Reducing Uncertainty in Structural Safety **MSCA-ITN-2020**
- 2015-2018 RESILENS: Realising European ReSiliencE for CritIcaL INfraStructure. **H2020-EU.3.7**
- 2014-2017 RAIN: Risk Analysis of Infrastructure Networks in response to extreme weather. **Seventh Framework Programme (REA)**
- 2014-2015 BRoWSER: Baselineing Road Works Safety on European Roads. **Conference of European Road Directors (CEDR) transnational research programme**
- 2011-2013 Optimization methods for rail and road traffic networks. **Spanish Ministry of Education and Science**

Publications

Selected peer-reviewed journal articles

Perspectives on the resilience of existing bridges to short- and long-term impacts of climate change. Shaban, N.; Arango, E.; Jimenez, A.; Rincon, L.F.; Shang, Y.; Habeeb, B.; Martín-Pérez, B.; Ferreira, T.M.; Mendoza-Lugo, M.; Ramírez Eudave, R.; Bastidas-Arteaga, E.; Hélder S. Sousa, H.S.; and Nogal M. *Structure and Infrastructure Engineering*, 2026.

A minimal model of plasticity across disciplines. de Jong, J. Nogal, M., Seebacher, F. and Fitzsimons, C.P. *Interdisciplinary Science Reviews*, 2026.

Co-Benefits of sustainable adaptation in enhancing climate resilience of reinforced concrete bridges. Kolioua, V.; Nogal, M., Esposito, R. and Bastidas-Arteaga, E. *Structure and Infrastructure Engineering*, Pp. 1-18, 2025.

Resilience assessment in post-wildfire recovery of road transport networks by dynamic thresholds and characteristic curves. Arango, E.; Nogal, M.; Yang, M.; Sousa, H.S.; Matos J.C. and Stewart, M.G. *Reliability Engineering & System Safety*, Vol. 264, Part B, 111365, 2025.

Prioritizing simulation-based stress tests to assess the resilience of transport systems: a computation-free methodology. Nasrazadani, H.; Nogal, M.; Adey, B. T. and Mitoulis, S.A. *Journal of Infrastructure Preservation and Resilience*, Vol. 6(16), 2025.

Cost-Informed Risk-based Inspection (CIRBI) for hydrogen systems components: A Novel approach to prevention strategies. Giannini, L.; Reniers, G.; Yang, M.; Nogal, M. and Paltrinieri, N. *Reliability Engineering & System Safety*, Vol. 260, 111063, 2025.

Wildfire preparedness: optimal measures for strengthening road transport resilience. Arango, E.; Nogal, M.; Sousa, H.S.; Matos J.C. and Stewart, M.G. *International Journal of Disaster Risk Reduction*, Vol. 121, 105371, 2025.

Towards Industry 5.0: A stakeholder analysis to understand the human role in the adoption of a heritage bridge human-centric digital twin framework. Jimenez Rios, A.; Plevris, V. and Nogal, M. *Structure and Infrastructure Engineering*, 1-15, 2025.

Dynamic quantitative assessment of service resilience for long-distance energy pipelines under corrosion. Huang, Y.; Qin, G.; Yang, M. and Nogal, M. *Reliability Engineering and System Safety*, 2025. Vol. 256, 110792

Network-level optimization approach for bridge interventions scheduling. Mendoza, M.; Nogal, M. and Morales-Napoles, O. *Structure and Infrastructure Engineering*, 2024.1-17

Industry 5.0, Towards an enhanced built cultural heritage conservation. Jimenez Rios, A.; Petrou, M.L.; Ramirez, R.; Plevris, V. and Nogal, M. *Journal of Building Engineering*, Vol. 96, 110542, 2024.

Enhancing infrastructure resilience in wildfire management to face extreme events: Insights from the Iberian Peninsula. Arango, E.; Jimenez, P.; Nogal, M.; Sousa, H.S.; Stewart, M.G. and Matos J.C. *Climate Risk Management*, Vol. 44, 100595, 2024.

Scaling-up dynamic charging infrastructure: Significant battery cost savings. Liao, X.; Nogal, M.; Tavasszy, L. and Saeednia, M. *Transportation Research Part D*, Vol. 129, 104128, 2024.

Improving societal resilience through a GIS-based approach to manage road transport networks under wildfires hazards. Arango, E.; Nogal, M.; Sousa, H.S.; Stewart, M.G. and Matos J.C. *Transportation Engineering*, Vol. 15, 100219, 2024.

Extreme-oriented sensitivity analysis using sparse polynomial chaos expansion. Application to train-track-bridge systems. Shang, Y.; Nogal, M.; Teixeira, R. and Wolfert, R. *Reliability Engineering & System Safety*, 109818, 2024.

Estimating bridge criticality due to extreme traffic loads in large highway networks with the use of probabilistic models. Mendoza, M.; Nogal, M. and Morales-Napoles, O. *Engineering Structures*, vol 300, 117172, 2024.

GIS-based methodology for road transport networks under wildfire events. Arango, E., Nogal, M., Sousa, H.S., Stewart, M.G. and Matos J.C. *International Journal of Disaster Risk Reduction*, 2023.

Dynamic thresholds for the resilience assessment of road traffic networks to wildfires. Arango, E., Nogal, M., Yang, M., Sousa, H.S., Stewart, M.G. and Matos J.C. *Reliability Engineering and System Safety*, 109407, 2023.

Optimal design of rail level crossings and associated transition zones using adaptive surrogate-assisted optimization. Shang, Y.; Nogal, M.; Teixeira, R. and Wolfert, R. *Engineering Structures*, Vol. 282, 115740, 2023.

Multi-region lifetime assessment of reinforced concrete buildings subjected to carbonation and climate change. Bastidas-Arteaga, E.; Gervasio, H.; Rianna, G. and Nogal, M. *Structures*, Vol. 45 Pp 886-899, 2022.

Dynamic mitigation control for construction project scheduling on-the-run. Kammouh, O.; Nogal, M.; Binnekamp, R. and Wolfert, R. *Automation in Construction*, Vol. 141, 104450, 2022.

Sensitivity method for extreme-based engineering problems. Nogal, M. and Nogal, A. *Reliability Engineering and System Safety*, 2021, vol. 216, 107997.

Mitigation Controller: an adaptive simulation approach for planning control measures in large construction project. Kammouh, O.; Nogal, M.; Binnekamp, R. and Wolfert, R. *Journal of Construction Engineering and Management - ASCE*, 2021, Vol. 147 (8):04021093.

Systems thinking approach for improving maintenance management of discrete rail assets: a review and future perspectives. Shang, Y.; Nogal, M.; Wang, H. and Wolfert, R. *Structure and Infrastructure Engineering*, 2021, 1-19.

Planning low-error SHM strategy with Constrained Observability Method. Peng, T.; Nogal, M.; Casas, J.R. and Turmo, J. *Automation in Construction*, 2021, vol. 127, 103707.

Multi-system intervention optimization for interdependent infrastructure. Kammouh, O.; Nogal, M.; Binnekamp, R. and Wolfert, R. *Automation in Construction*, 2021, vol. 127, 103698.

Adaptive approaches in metamodel-based reliability analysis: A review. Teixeira, R.; Nogal, M. and O'Connor, A. *Structural Safety*, 2021, vol. 89, 102019.

Simulation-based Education involving Online and On-Campus Models in different European Universities. Campos, N.; Nogal, M.; Caliz, C. and Juan, A. A. *International Journal of Educational Technology in Higher Education*, 17:8, 2020.

Structured expert judgment to understand the intrinsic vulnerability of traffic networks. Nogal, M.; Morales-Napoles O. and O'Connor, A. *Transportation Research Part A: Policy and Practice*, vol 127, pp. 136–152, 2019.

Probabilistic sensitivity analysis of OWT using a transformed Kullback-Leibler divergence. Teixeira, R.; O'Connor, A. and Nogal, M. *Structural Safety*, Vol 81, pp. 101860, 2019.

Assessment of road traffic resilience assuming stochastic user behaviour. Nogal, M. and Honfi, D. *Reliability Engineering & System Safety*, Vol. 185, pp. 72-83, 2019.

Novel probabilistic resilience assessment framework of transportation networks against extreme weather events. Nogal, M.; O'Connor, A.; Martinez-Pastor B. and Caulfield, B. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, Vol.3(3), 2017 (04017003).

Resilience of traffic networks: from perturbation to recovery via a dynamic restricted equilibrium model. Nogal, M.; O'Connor, A.; Caulfield, B. and Martinez-Pastor B. *Reliability Engineering & System Safety*, vol. 156 pp. 84–96, 2016.

Coherent and compatible statistical models in structural analysis. Nogal, M.; Castillo, E.; Calviño A. and O'Connor, A. *International Journal of Computational Methods*, vol. 13, no. 2, 1640008 (18 pages), Mar. 2016.

Book and chapters

Modelling, Uncertainty, and Data Analysis for Engineers Textbook. Lanzafame, R. C. (ed.), van Woudenberg, T. R. (ed.), Verhagen, S. (ed.), Cabboi, A., Mares Nasarre, P., Lanzafame, R. C., Verhagen, S., Arriaga, J., Pittman, J. C., van der Meer, F. P., Tiberius, C. C. J. M., Amiri Simkooei, A., Correia, G., Nogal, M., Gao, J., Ahmadi, B., Rocha, I. B. C. M., Poot, A., Storm, J., Riccius, L. F., & 1 others *Delft University of Technology*, 2024.

Climate change-related risks and adaptation of interdependent infrastructure systems. In: Climate Adaptation Engineering. Val, D. V., Yurchenko, D., Nogal, M. and O'Connor, A. *pp. 207-242, Butterworth-Heinemann, Elsevier*, 2019.

Considerations of Resilience Management in Transportation. In: IRGC Resource Guide on Resilience (vol. 2): Domains of resilience for complex interconnected systems. Nogal, M. and O'Connor, A. , Dec. 2018.

Resilience assessment of transportation networks. In: Handbook of Sustainable and Resilient Infrastructure. Nogal, M. and O'Connor, A. *Chapter 11, Routledge International Handbooks*, 2018, ISBN: 9781138306875.

Cyber-Transportation Resilience. Context and methodological framework. In: Resilience and Risk. Nogal, M. and O'Connor, A. *pp. 415-426. Springer International Publishing*, 2017, DOI: 10.1007/978-94-024-1123-2_15, ISBN: 978-94-024-1122-5.

Folding the digital world into resilience-building efforts. In: Resilience and Risk. Roeg P. E., Collier, Z. A., Chevardin, V., Chouinard, P. Florin, M. V., Lambert, J. H., Nielsen, K., Nogal, M. and Todorovic, B. *pp. 383-414 Springer International Publishing*, 2017, ISBN: 978-94-024-1122-5.

Conference Proceedings (last 2 years)

Digital Twins in Flood Resilience: Potential, Challenges and Reliability for Urban Applications. Arango, E.; Soman, R. and Nogal, M. *International Conference on Resilient Systems 2026, Delft (Netherlands)*.

Flood resilience through integrated digital twin approaches: A multi-model framework co-designed with stakeholders. Arango, E.; Nogal, M.; Balaban, O., Kumar, S. and Soman, R. *International Climate Resilience Conference 2025, Munich (Germany)*.

Climate change induced carbonation of reinforced concrete buildings in European cities. Dimova S.; Sousa M.L.; Gervásio H.; Rianna G.; Bastidas-Arteaga E.; and Nogal M. *21st International Probabilistic Workshop (IPW 2025), Rostock (Germany)*.

Advancing built cultural heritage conservation: Integration of Industry 5.0 principles and enabling technologies. Jimenez Rios, A.; Ramirez, R.; Petrou, M.L.; Plevris, V. and Nogal, M. *14th International Conference on Structural Analysis of Historical Constructions (SAHC 2025), Lausanne (Switzerland)*.

Climate change induced carbonation and corrosion of EU building stock: recent findings. Dimova, S.; Polo López, C.S.; Sousa, M.L.; Rianna, G.; Bastidas-Arteaga, E.; Nogal, M.; Gervásio, H; Martorana, E.; Reder, A. and Athanasopoulou, A. *fib Symposium 2025. Concrete structures: extend lifespan, limit impacts, Antibes (France)*.

Uncertainty quantification of wire tolerances in coil. Zubacicius, R.; Nogal, M.; Fu, G.; Curti, M. and Morales-Napoles, O. *6th International Conference on Uncertainty Quantification in Computational Science and Engineering, UNCECOMP2025, Rhodes (Greece)*.

Uncertainty quantification in laser powder bed fusion using multi-physics numerical simulation and copula-based analysis. Zhang, Y., Nogal, M.; Rocha, I. B. C. M. and Morales Napoles, O. *6th International Conference on Uncertainty Quantification in Computational Science and Engineering, UNCECOMP2025, Rhodes (Greece)*.

Forward uncertainty propagation for finite element models with non-gaussian parameters. Barros, R.; Rocha, I. B. C. M.; Nogal, M. and Morales-Napoles, O. *6th International Conference on Uncertainty Quantification in Computational Science and Engineering, UNCECOMP2025, Rhodes (Greece)*.

A computation-free methodology for prioritizing simulation-based stress tests for assessing the resilience of transport systems. Nasrazadani, H.; Nogal, M.; Adey, B.T. and Stergios, A.M. *European Safety and Reliability and Society for Risk Analysis Europe. ESREL SRA-E 2025. Stavanger (Norway)*.

Formalizing stakeholder's perspectives to assess systemic resilience to urban flooding. Arango, E.; Nogal, M.; Bosch-Rekveltdt, M.; Soman, R.K. and Ninan, J. *European Safety and Reliability and Society for Risk Analysis Europe. ESREL SRA-E 2025. Stavanger (Norway)*.

A methodology for prioritizing simulation-based stress tests for transportation systems. Nasrazadani, H., Adey, B.T., Nogal, M. and Mitoulis, S. *Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2024), Chicago (USA)*.

Towards the creation of synthetic bridge digital twins what-if scenarios: study case and calibration. Jimenez Rios, A.; Demirlioglu, K.; Plevris, V. and Nogal, M. *9th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), 2024, Lisboa (Portugal)*.

The risk of divergence in resilience. Baroud, H.; Kammouh, O. and Nogal, M. *34-th European Safety and Reliability Conference (ESREL) 2024, Krakow (Poland)*.

Effects of workforce productivity on infrastructure resilience. Sharmaa, N; Kammouh, O., Nogal, M. and Gardoni, P. *34-th European Safety and Reliability Conference (ESREL) 2024, Krakow (Poland)*.

Towards fire-resilient landscapes: strategies for reducing exposure to extreme wildfires. Arango, E.; Nogal, M.; Dou, Y.; Sousa, H.; Matos, J.C. and Stewart M.G.. *34-th European Safety and Reliability Conference (ESREL) 2024, Krakow (Poland)*.

Human role in existing bridge digital twin frameworks, towards industry 5.0. Jimenez Rios, A.; Plavis, V. and Nogal, M. *12th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2024), 2024, Copenhagen (Denmark)*.

Technical reports

Prospects for implementation of Fire Safety Engineering approach in Europe, Publications Office of the European Union, Luxembourg, 2025. Sciarretta, F.; Athanasopoulou, A.; Polo Lopez, C.S.; Tsionis, G.; Debrouwere, B.; Jönsson, J.; Joyeux, D.; Kotsovinos, P; Manzello, S. L.; Merci, B.; Nogal M.; Okwara, F.; Poulsen, A.; Rios, O.; Samaras, P.; Tondini, N.; Van Hees, P.; Węgrzyński W. , doi:10.2760/1335237.

Climate change adaptation for the built environment: developments and needs for structural design standards, Publications Office of the European Union, Luxembourg, 2025. Polo López, C.; Tsionis, G.; Athanasopoulou, A.; Sciarretta, F.; Reder, A.; Rianna, G.; Dosio, A.; Cagnazzo, C.; Formichi, P.; Croce, P.; Landi, F.; Nogal, M.; Dimova, S.; Sousa, M.L.; Catarino, J.M.; Oliveira Santos, L.; Deus, R.; Cabrinha, V.; Wichura B. and Castino, F. , doi:10.2760/3620533.

Impact of climate change on the corrosion of the European building stock, Publications Office of the European Union, Luxembourg, 2024. Dimova, S.; Polo López, C.S.; Sousa, M.L.; Rianna, G.; Bastidas-Arteaga, E.; Nogal, M.; Gervasio, H.; Martorana, E.; Reder, A. and Athanasopoulou, A.; G. , doi:10.2760/016004, JRC137288.

Expected implications of climate change on the corrosion of structures, EUR 30303 EN, Publications Office of the European Union, Luxembourg, 2020,. Sousa, M.L.; Dimova, S.; Athanasopoulou, A.; Rianna, G.; Mercogliano, P.; Villani, V.; Nogal, M.; Gervasio, H.; Neves, L.; Bastidas-Arteaga, E.; Tsionis, G. pp. 207-242, Butterworth-Heinemann, Elsevier , ISBN 978-92-76-20782-5, doi:10.2760/25513, JRC121312.

Software and other scientific outputs

Shang, Y.; Nogal, M. (2024): Data underlying the publication: Extreme-oriented sensitivity analysis using sparse polynomial chaos expansion. Application to train-track-bridge systems. Version 1. 4TU.ResearchData. dataset. <https://doi.org/10.4121/9a572878-a5b9-4976-a5a4-1de891f55fc8>.

MitC: An open-source software for construction project control and delay mitigation. Kammouh, O.; Nogal, M. and Kok, M. (2021) <https://github.com/mitigation-controller/mitc>.

ProFatigue: a software program for probabilistic assessment of experimental fatigue data sets. Castillo, E.; Fernandez-Cantelli, A.; Gonzalez-Collado, S.; Lopez-Aenlle, M. Nogal, M.; Pinto, H.; Przybilla, C. and Ramos-Garrido, A. (2012) <https://dcif.uniovi.es/profatigue>.

Academic recognition

Awards and distinctions

- 2026 Included in the Choiseul Institute list of **Spanish leaders in the knowledge economy**
- 2025 **VII Jose Maria Sarriegi Scientific Divulagation Award** by the Catastrophe Observatory of the Asociacion Cluster Catastrofes, with the sponsorship of Berkshire Hathaway Specialty Insurance and the collaboration of the University of Navarra
- 2024 **Best Paper Award** on Climate Change Governance by the TU Delft Climate Action Programme
- 2014 **ICCM2014 Best Paper Award**. 5th International Conference on Computational Methods (Cambridge)
- 2014 **XIV Talgo Award for Technological Innovation**. Talgo is a major Spanish manufacturer of high-speed and intercity trains and one of Europe's leading rail exporters.
- 2012 **I International Abertis Research Prize** and **IX National Abertis Research Prize** in Transport Infrastructure Management. Abertis is a major Spanish infrastructure management company, operating close to 8,000 km of high-capacity toll roads across 15 countries.

Invited lectures and keynote/guest talks

- 2025-11 **Guess talk** on The role of uncertainty in Resilience Engineering, hosted by **Lund University** (Sweden)
- 2024-03 **Guess talk** on Bringing the social dimension into resilience assessments of socio-physical systems hosted by **The University of Sydney** (Australia)
- 2023-02 **Guess talk** on Resilience Engineering. How to operationalise the concept of resilience, hosted by **ETHZ** (Switzerland)
- 2022-11 **Invited lecture** on Assessing resilience of road transport networks to wildfire hazards, hosted by **Stanford University** (USA)
- 2020-10 **Keynote** on *Prescription of maintenance interventions by the new generation of Eurocodes for climate-change resilient structures*, **XV International Conference on Durability of Building Materials and Components**, Barcelona (Spain)
- 2019-11 **Invited lecture** on Challenges of Extreme Events for Resilient Infrastructures, **Herrenhausen Conference** "Extreme Events: Building Climate Resilient Societies". Hannover (Germany)
- 2017-11 **Guess talk** on *The challenge of numerical assessment of the resilience of the built environment*. **Workshop ICSO 2017**, Castelldefels (Spain)
- 2017-01 **Invited lecture** on *Reducing uncertainty through the Structured Expert Elicitation: justification and methodology*. **TRUSS training week**, Barcelona (Spain)
- 2016-06 **Invited lecture** on *The challenge of the numerical assessment of resilience*. Advanced Research Workshop on Resilience-based approaches to critical infrastructure safeguarding, hosted by **NATO**
- 2016-05 **Invited lecture** on *Resilience: From the general to the specific*. Smart Resilience Conference. Science Gallery (Ireland)
- 2015-12 **Invited lecture** on *Results from FP7 RAIN Project relevant to impacts of climate change on structural design*. Workshop on implications of climate change on structural design, hosted by **Joint Research Centre**

2013-11 **Invited lecture** on *The observability techniques applied to Structural System Identification* hosted by the School of Engineering. **University of North Florida** (USA)

Scientific contributions and service

Participation in scientific committees

Since 2026 **Scientific member** of Working Group 5.4 on Climate Change Implications on Asset Management of Infrastructure, International Association for Bridge and Structural Engineering (IABSE)

Since 2024 **Management team member** of TU Delft Safety and Security Institute (Netherlands)

Since 2023 **Board member** of the International Civil Engineering Risk and Reliability Association (CERRA)

Since 2022 **Scientific member** of Working Group 5.8 on Resilience of Existing Structures, International Association for Bridge and Structural Engineering (IABSE)

Since 2019 **Associated Scientist** of the 4TU.Resilience Engineering within the 4TU.Federation (Netherlands)

Since 2017 **Expert member** of the Climate Change Adaptation and Fire Safety Engineering Networks coordinated by the European Joint Research Centre (JRC)

Organization of special sessions and workshops

2026-05 **Conference track** on *Defining and Determining Resilience of Critical Infrastructure and Communities*, Information Systems for Crisis Response and Management (ISCRAM 2026), The Hague (Netherlands).

2026-03 **Conference track** on *Digital foundations of Resilient Built Environments*, International Conference on Resilient Systems (ICRS 2026), Delft (Netherlands).

2024-06 **Special session** on *Recent ontological, methodological, and operational advances in resilience*, 34th European Safety and Reliability Conference (ESREL2024), Poland

2024-06 **Special session** on *Development and applications of computational methods for digital twins*, 9th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2024), Lisbon (Portugal)

2024-06 **Special session** on *Digital twins and industry 5.0: towards a sustainable bridge maintenance, safety, and management holistic approach*, 12th Conference on Bridge Maintenance, Safety and Management (IABMAS 2024), Copenhagen (Denmark)

2024-06 **Special session** on *Innovative methods for vulnerability and resilience analyses of infrastructures*, 3rd International Conference on Resilience, Earthquake Engineering, and Structural Health Monitoring (ICONREM), Turin (Italy)

2023-07 **Special session** on *Risk, reliability and resilience of complex systems*, 14th International conference on application of statistics and probability in Civil Engineering, ICASP14, Dublin (Ireland)

2022-11 **Workshop** on *Resilience of Complex Systems: feed-up, feedback, and feed-forward*. DESIRE programme (4TU.RE), Delft (Netherlands).

2022-08 **Special session** on *Transdisciplinary design of future sustainable and resilient infrastructure*, 32th European Safety and Reliability Conference (ESREL2022), Dublin (Ireland)

2021-09 **Special session** on *Decision Science for resilience*, 31st European Safety and Reliability Conference (ESREL2021), Angers (France)

2020-06 **Special session** on *Human performance in resilience, risk and safety assessments*, 30th European Safety and Reliability Conference and the 15th Probabilistic Safety Assessment and Management Conference (ESREL2020-PSAM15), Venice (Italy).

2020-06 **Special session** on *Life Cycle-Based Resilience Assessment and Management of Structural and Infrastructural Assets*, 30th European Safety and Reliability Conference and the 15th Probabilistic Safety Assessment and Management Conference (ESREL2020-PSAM15), Venice

2019-05 **Special session** on *Resilience assessment of transportation systems*, 13th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP13), Seoul (Korea)

2018-07 **Special session** on *Resilience of Bridges to Climate Change, Natural & Man Made Hazards*, 9th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018), Melbourne (Australia)

Reviewer service for research councils and funding bodies

Since 2017	Expert Evaluator for the Research Executive Agency of the European Commission , including research competition (MCSA and Pathfinder programs) and project evaluations
2024	Scientific Evaluator for the European Science Foundation (Luxemburg)
2023	External reviewer for Icelandic Science and Technology Policy Council .
2020	Scientific Evaluator for the National Science Centre (Poland)

Editorial service

Since 2024	Editorial Board Member of the journal Reliability Engineering and System Safety
2024-2025	Guest Editor of Special Issue on Advancements in Integrating Physics and Machine Learning for System Reliability, Risk, and Resilience Analysis, in journal of Reliability Engineering and System Safety (RESS)
2018-2024	Editorial Board Member of Springer Nature Applied Sciences (SNAS) and Alexandria Engineering Journal (Elsevier), Civil Engineering Section

External examiner of PhD students

2024-12	PhD thesis by Hamed Mehranfar, ETHZ (Switzerland)
2021-09	PhD Thesis by Leandro do Carmo Martins, Universitat Oberta de Catalunya (Spain)
2019-01	PhD Thesis by Radson Lima Figueiredo, Trinity College Dublin (Ireland)
2018-12	PhD Thesis by Aljoscha Gruler, Universitat Oberta de Catalunya (Spain)
2018-06	PhD Thesis by Jun LEI, Polytechnic University of Catalunya (Spain)
2017-12	PhD Thesis by Elena Mora Villazan, University of Cantabria (Spain)
2017-06	PhD Thesis by Laura Calvet Liñán, University of Catalunya (Spain)
2017-01	PhD Thesis by Miguel Casero, University of Oviedo (Spain)
2016-06	PhD Thesis by Paola Moraga, University of Cantabria (Spain)
2015-12	PhD Thesis by Zacarias Grande Andrade, University of Cantabria (Spain)
2013-05	PhD Thesis by José Ramón Díaz de Terán, Polytechnic University of Catalunya (Spain)
2012-09	PhD Thesis by Eusebio Angulo, University of Castilla-La Mancha (Spain)

Teaching and supervision

Courses taught

Since 2022	CME4150 Managing Uncertainty & Data. MSc Degree in Construction Management and Engineering. TU Delft (coordinator).
Since 2022	CME5021 Research & Development Methods. MSc Degree in Construction Management and Engineering. TU Delft (lecturer)
2021-2022	CIE4130 Probabilistic Design. MSc Degree in Civil Engineering. TU Delft (lecturer)
2021-2022	AR3CS100 Graduation Studio Cross Domain City of the Future. MSc Degree in Architecture, Urbanism & Building Sciences. TU Delft (lecturer)
Since 2020	CIE4391 (CME4500, 4501) Engineering Systems Optimization. MSc Degree in Construction Management and Engineering. TU Delft (coordinator)
Since 2020	CEGM1000 Modelling, Uncertainty and Data for Engineers. MSc Degree in Civil Engineering. TU Delft (lecturer)
2019-2022	CIE4381 (CME4300) Engineering Asset Management MSc Degree in Construction Management and Engineering. TU Delft (lecturer)
2018-2019	Civil Engineering for Sustainable Development. MSc in Development Practice. Trinity College Dublin (lecturer)
2017-2019	Advanced Design of Structures. BAI/MAI in Civil Eng. Trinity College Dublin (coordinator)
2017-2019	Engineering Design III. BAI/MAI in Civil Eng. Trinity College Dublin (coordinator)
2016-2018	Solids and structures. BAI/MAI in Civil Eng. Trinity College Dublin (lecturer)
2015-2017	Research Methods. MAI/MSc in Civil Eng. Trinity College Dublin (lecturer)
2013-2014	Computer Modeling in Engineering. MSc in Civil Engineering. University of Cantabria (lecturer)
2011-2012	Algebra and Geometry. BAI/MAI in Mechanical Engineering, BAI/MAI in Industrial Electronics and Automation and BAI/MAI in Electrical Eng. University of Cantabria (lecturer)

Supervision of PhD theses

PhD theses supervised to completion

- 2025-09 *Virtual laboratories for mathematical learning in online and face-to-face higher education environments* by Neila Campos. Faculty of Computer Science, Multimedia and Telecommunication. Universitat Oberta de Catalunya (Spain). Supervisors: Drs M. Nogal and A. Perez Navarro
- 2025-05 *Probabilistic-based methods for extreme traffic loads mapping to assist bridge portfolio management* by Miguel Angel Mendoza Lugo. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs O. Morales and M. Nogal
- 2025-03 *Real-time traffic prediction and optimisation in intelligent transportation systems under variable speed limits* by Amirreza Kandiri. School of Civil Engineering, University College Dublin (Ireland). Supervisors: Drs R. Teixeira and M. Nogal
- 2024-03 *Design optimization for railway transition zones* by Yue Shang. Faculty of Civil Engineering & Geosciences, TU Delft. Supervision: Drs R. Wolfert and M. Nogal
- 2021-05 *Structural System Identification by Dynamic Observability Technique* by Tian Peng. School of Civil Engineering. Polytechnic University of Catalunya (Spain). Supervision: Drs J.R. Casas, J. Turmo and M. Nogal
- 2019-02 *Probabilistic optimisation of the design of offshore wind turbine towers* by Rui Teixeira. School of Civil, Structural & Environmental Eng. Trinity College Dublin (Ireland). Supervision: Drs A. O'Connor and M. Nogal
- 2017-12 *Resilience of Traffic Networks to Extreme Weather Events: Analysis and Assessment*, by Beatriz Martinez-Pastor. School of Civil, Structural & Environmental Eng. Trinity College Dublin (Ireland). Supervision: Drs A. O'Connor and M. Nogal

PhD theses under supervision

- Since 2026 *Development of an integrated process & infrastructure safety & security management framework based on the resilience paradigm* by Giorgia Riti. Faculty of Technology, Policy and Management, TU Delft. Supervisors: Drs M. Yang and M. Nogal
- Since 2025 *Integrated big data processing and management of long-term monitoring* by Lukas Bohem. Faculty of Civil Engineering & Geo, TU Delft. Supervisors: Drs G. Giardina and M. Nogal
- Since 2025 *Improving decision making for infrastructure management through multi-fidelity digital twins (MFDT)* by Ahmed Shalabi. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs M. Hertogh and M. Nogal
- Since 2025 *Artificial super intelligence for autonomous inspection and system state monitoring to improve system resilience* by Yoosef Habibi. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs G. Giardina and M. Nogal
- Since 2024 *Uncertainty quantification and reduction for industrial critical components using probabilistic and deep learning-based approaches* by Yunfan Zhang. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs O. Morales and M. Nogal
- Since 2024 *Efficient techniques for the assessment of uncertainties of physics-based models on the design of critical components* by Renan Melo Barros. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs O. Morales and M. Nogal
- Since 2024 *Reliability analysis of linear actuators* by Romas Zubavicius. Faculty of Civil Engineering & Geosciences, TU Delft. Supervisors: Drs O. Morales and M. Nogal