

# Tammam Bakeer

Dr.-Ing. habil.

Computational Structural Mechanics | Reliability

UQ · Digital Twins · Risk-Informed Assessment

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**Profile.** I develop computational, reliability-based and data-informed methods for the analysis and assessment of complex structural systems, and for decision-making under uncertainty. Over twenty years across nonlinear computational mechanics, structural reliability, Bayesian inverse methods and monitoring-based assessment, with contributions to European standardization and major infrastructure.

Computational Mechanics   Structural Reliability   Uncertainty Quantification   Bayesian Inverse Methods   Digital Twins

## SELECTED EVIDENCE

- Own research programme on information sufficiency and decision identifiability in structural inverse problems; journal article in *Mechanical Systems and Signal Processing* (2026), funding proposal prepared.
- R&D on digital twins, monitoring and data-driven reliability assessment of bridges.
- Assessment of existing and heritage structures: Sagrada Família, Casa Milà, Bam Citadel, Friedrichswerder Church.
- Ten years teaching in the ACCESS Master's programme at TU Dresden; 46 supervised theses, project works and doctorates.

## CAREER PATH

|                   |                                                                                                                                                                             |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Since 10/2025     | <b>Own Research Programme</b> , research in digital twins, structural reliability, inverse problems and uncertainty quantification · Dresden                                |
| Since 2025        | <b>Research Supervision and Project Development</b> , Institute for Risk and Reliability, Leibniz University Hannover · Hannover                                            |
| 03/2025 – 09/2025 | <b>R&amp;D Engineer – Digital Twins</b> , MKP GmbH – Marx Krontal Partner · Dresden                                                                                         |
| 02/2020 – 10/2024 | <b>Expert in Structural Reliability, Advanced Structural Analysis and Dynamics</b> , Engineering and Consulting Office for Civil Engineering · Radebeul / Frankfurt am Main |
| 10/2019 – 03/2021 | <b>Lecturer and Supervisor in the ACCESS Master's Program</b> , Institute of Structural Mechanics and Dynamics, TU Dresden · Dresden                                        |
| 01/2014 – 09/2019 | <b>Senior Research Associate and Project Manager</b> , Chair of Structural Engineering, TU Dresden · Dresden                                                                |
| 05/2017           | <b>Habilitation (Dr.-Ing. habil.)</b> , Structural Engineering, TU Dresden · Dresden                                                                                        |
| 01/2008 – 12/2013 | <b>Expert in Structural Dynamics &amp; Numerical Simulations</b> , Jäger Engineers GmbH · Radebeul                                                                          |
| 10/2008 – 12/2013 | <b>Research Associate</b> , Chair of Structural Engineering, TU Dresden · Dresden                                                                                           |
| 05/2009           | <b>Doctorate (Dr.-Ing.)</b> , Structural Engineering, TU Dresden · Dresden                                                                                                  |
| 10/2007 – 09/2008 | <b>Freelance FEM Computational Engineer</b> , SVB Engineering Office for Structural Analysis · Leipzig                                                                      |
| 10/2006 – 09/2008 | <b>Doctoral Candidate in Structural Dynamics</b> , Chair of Structural Engineering, TU Dresden · Dresden                                                                    |
| 10/2005 – 09/2006 | <b>Master's Studies in Rehabilitation Engineering</b> , TU Dresden · Dresden                                                                                                |
| 04/2004 – 09/2005 | <b>Lecturer in Structural Mechanics</b> , University of Homs · Homs, Syria                                                                                                  |
| 09/2003 – 09/2005 | <b>Structural Engineer</b> , Engineering Office of Homs University · Homs, Syria                                                                                            |
| 09/2002 – 08/2003 | <b>Diploma in Structural Engineering</b> , University of Homs · Homs, Syria                                                                                                 |
| 09/1997 – 08/2002 | <b>Bachelor of Civil Engineering (B.Sc.)</b> , University of Homs · Homs, Syria                                                                                             |

## SELECTED PUBLICATIONS

- *Sensor informativeness, identifiability and uncertainty in Bayesian inverse problems for structural health monitoring*, Mechanical Systems and Signal Processing 257, 114606, 2026.
- *Local information operators for spatial identifiability in distributed-parameter inverse problems in computational mechanics*, arXiv preprint, 2026 (sole author).
- *General partial safety factor theory for the assessment of the reliability of nonlinear structural systems*, Reliability Engineering & System Safety 234, 109150, 2023 (sole author).
- *Reliability assessment of vertically loaded masonry walls*, Structural Safety 62, 47–56, 2016 (sole author).

## EXPERTISE, METHODS AND TOOLS

Structural reliability and uncertainty quantification · risk-informed assessment · Bayesian inverse problems and identifiability · digital twins and SHM · nonlinear FEM and DEM · structural dynamics · Eurocode safety formats · Python, Matlab · ANSYS, LS-DYNA, ABAQUS · SOFiStiK, Dlubal RFEM · HPC simulation workflows · Bayesian and frequentist statistics · machine learning methods ·  $\LaTeX$

## STANDARDS, COMMITTEES AND LANGUAGES

CEN/TC 250 (EN 1990, EN 1996) | JCSS | DIN committees on earthquake safety | Arabic, German, English