

CIVIL-COMP 2023
The Seventeenth International Conference on
Civil, Structural and Environmental Engineering Computing
28-31 August 2023
Pécs, Hungary

Special Session: CC-S9

Uncertainty Quantification
and
Reliability Assessment of Engineering Structures

Organizer:

Professor Marcin Kamiński

Head of Research in Civil Engineering, Geodesy & Transportation

Department of Structural Mechanics

Faculty of Civil Engineering, Architecture and Environmental Engineering

Lodz University of Technology, Al. Politechniki 6, 93-590 Lodz, Poland

Email: Marcin.Kaminski@p.lodz.pl

Aims and scope:

Uncertainty quantification in engineering structures using modern computational techniques is the main scope of this mini-symposium. Some recent developments in Bayesian approach, fuzzy set methodology, simulation and perturbation methods, spectral as well as probability density transformation techniques are welcome. Submissions devoted to experimentally driven probabilistic computations, practical large-scale stochastic analyses, and also some theoretical developments of the existing numerical methods would be especially attractive. Applications area include civil, mechanical, aeronautical, material as well as environmental engineering together with transportation issues and other applied sciences problems. Possible Authors are specifically encouraged to demonstrate computer analyses with relatively large input statistical scattering, numerical error and probabilistic convergence studies, discretization sensitivity of the output random response and statistical correlation effects in multivariate problems.

The second area of the interest would be reliability assessment, where the First and the Second Order Reliability Methods (FORM & SORM) have been engaged. Higher order techniques together with simulation-based methodologies, and also probabilistic entropy related approaches are expected, too. Such reliability studies may cover both time-independent and time-varying case studies, where some structural parameters are described using e.g. time series with random coefficients. Therefore, a discussion of stochastic ageing due to corrosion or fatigue phenomena could be also presented. The applications of any of the existing reliability

and durability methods to the real engineering structures with the use of the Stochastic Finite or Boundary Element Methods would be especially interesting.

Acknowledgment

This mini-symposium is organized in the framework of the research grant OPUS no. 2021/41/B/ST8/02432 “Probabilistic entropy in engineering computations” sponsored by the *National Science Center* in Cracow, Poland.