Call for Papers: Special Issue

ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems:
Part A. Civil Engineering
Part B. Mechanical Engineering
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Special Issue: Papers needed for inaugural issues

Special Topic

Non-probabilistic Approaches for Handling Uncertainty in Engineering

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Background

Realistic numerical modelling of physical and mechanical phenomena is Necessary to obtain reliable predictions in engineering analyses. It is widely recognized that inclusion of uncertainties in the numerical description of physical reality increases the credibility of computation results. In the last decades, the development of non-deterministic procedures has increasingly spread within the engineering field. The crucial point is the description of uncertainties by an appropriate mathematical model based on the underlying reality and available information. Uncertainties are commonly described within a probabilistic framework as random variables (or random fields) with assigned probability density function. However, the credibility of traditional probabilistic methods becomes questionable when only limited data are available to define the probabilistic distribution of non-deterministic quantities. The awareness of this limitation has aroused the interest of researchers towards alternative less information-sensitive uncertainty models based on non-probabilistic concepts, such as convex models, fuzzy set theory or interval models. While traditional probabilistic methods are well-established, non-probabilistic approaches still need further developments in view of their application for modeling and processing uncertainties in real engineering problems. Current research efforts are devoted to achieve this goal by extending the theoretical basis and enhancing computational efficiency of non-probabilistic methods.

Scope

The scope of this Special Issue includes non-probabilistic approaches within the general framework of non-deterministic engineering analyses. Authors are invited to discuss theoretical issues, implementation strategies and computational efficiency in view of realistic modeling and processing of uncertainties in practical engineering problems as they relate to risks and systems.

Selected Focus Topics

Potential topics may include, but are not limited to:
- Interval models
- Convex models
- Fuzzy sets
- Mixed probabilistic/non-probabilistic models
- Non-probabilistic finite element procedures
- Reliability analysis
- Sensitivity analysis
- Optimization

Paper Submission

To submit a manuscript for consideration for the special issue, please visit the journal website at:
http://bit.ly/1fjTQCc
Choose the Special Issue option for "Non-probabilistic Approaches for Handling Uncertainty in Engineering".

Timeline

Deadline for Submission: September 30, 2014

Resources for Authors

Civil Engineering (ASCE) http://bit.ly/1fjV7sS
Mechanical Engineering (ASME) http://bit.ly/1dakPMp

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