Artificial Intelligence for Engineering Design, Analysis and Manufacturing (2015), *29*, 525.
© Cambridge University Press 2015 0890-0604/15
doi:10.1017/S0890060415000505

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AI EDAM Special Issue, May 2017, Vol. 31, No. 2
Uncertainty Quantification for Engineering Design

Guest Editors: Roger Ghanem & Xiaoping Du

Engineering design is generally predicated on a presumed behavior of a given system in response to a specified range of loading conditions. With improved sensing, control, and adaptation schemes, external and internal conditions are both characterized with increasing accuracy, permitting safer operation closer to the failure envelope. These technological and scientific advances notwithstanding, discrepancies remain between anticipated and actual behaviors of most engineered systems, often becoming significant as instabilities or failure are approached. The ability to understand, analyze, and characterize the sources and the impact of these errors will have important ramifications on the economy, performance, and safety of these systems.

Recent advances on the topic of uncertainty quantification have enabled the closer integration of data-driven and model-driven paradigms for parameter characterization and performance prediction of many systems of interest in science and engineering. The impact of these capabilities on engineering design are just beginning to be felt with significant implications on the interplay among performance, efficiency, and risk of specific products and the design process as a whole.

This Special Issue on uncertainty quantification for engineering design will consider contributions that demonstrate the significance of uncertainty quantification on any aspect of the design process. A sample of issues to be considered includes the following:

- formulation of novel objective functions and constraints for a design that accounts for uncertainty
- development of efficient algorithms for optimization in the presence of uncertainty
- integration of sensing and uncertainty reduction into the design process
- assessment and management of uncertainty in early stage design
- integration of management and supply-chain uncertainties into the design process
- general insight gained from comprehensive case studies
- uncertainty in designs with multiscale or multiphysics behavior
- uncertainty models, algorithms, and assessment for multidisciplinary design optimization

All submissions will be anonymously reviewed by at least three reviewers. The selection for publication will be made on the basis of these reviews. High quality papers not selected for this Special Issue may be considered for standard publication in *AI EDAM*.

Information about the format and style required for *AI EDAM* papers can be found at http://aiedam.usc.edu/index.php/Authors/ForAuthors

Note that all inquiries for Special Issues go to the Guest Editors, **not** to the Editor in Chief.

Important Dates

Intent to submit (Abstract & Title):	As soon as possible
Submission deadline for full papers:	February 1, 2016
Reviews due:	April 15, 2016
Notification and reviews due to authors:	May 1, 2016
Revised papers due from authors:	July 1, 2016
Notification and second reviews due to authors:	September 15, 2016
Second revised paper due from authors:	December 1, 2016

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https://doi.org/10.1017/S0890060415000505 Published online by Cambridge University Press