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Bayesian Sensitivity Analysis of Numerical Models for Structural Health Monitoring

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The scarcity of damaged-state data is an abiding problem in practical applications of structural health monitoring. Given this scarcity, it is perhaps unsurprising that many of the techniques proposed for the SHM make use of physics-based modelling in order to 'fill in the blanks'. The aim of developing the model is often, but not exclusively, to act as the basis for a model-update type SHM strategy. However, it is possible to get more out of a developed numerical model. By probing the physical interactions encapsulated in the model a comprehensive picture of the relationships between inputs and outputs can be constructed. In this paper, a global sensitivity analysis approach is demonstrated for this purpose. The techniques applied reflect progress in the field of analysis of complex computational models, and make use of both code emulation and Bayesian statistical methods.

Ключевые слова:

Содержание.

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