

European Safety and Reliability Conference

ESREL' 2015 – ETH Zürich

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“Surrogate models for structural reliability analysis”

Structural reliability methods have received much attention in the mechanical, civil, and aerospace engineering communities over the past two decades. Beyond crude Monte Carlo simulation which is not efficient to estimate small probabilities of failure of systems, well-known methods such as FORM/SORM are nowadays applied in an industrial context, e.g. nuclear, aerospace, and automotive industries, among others.

However, accurate computational models (e.g., finite element models) of complex structures or systems are usually costly to evaluate. A single run of such a model may last minutes to hours, even on powerful computers. In order to use these models in reliability analysis and reliability-based design optimization, it is thus necessary to develop a substitute that may be evaluated thousands to millions of times at low cost: these substitutes are referred to as *surrogate models*.

The aim of this session is to confront various kinds of surrogate modelling techniques including classical response surfaces, polynomial chaos expansions, Kriging, etc. Papers that present new methodology developments as well as large scale industrial applications that make use of surrogate models are welcome.

Organizers

Prof. B. Sudret (ETH Zurich, Switzerland)

Prof. J.-M. Bourinet, N. Gayton (IFMA, France)