

PhD Position

“Bayesian techniques for model validation and stochastic inverse problems”

The Chair of Risk, Safety and Uncertainty Quantification in Engineering develops computational methods for managing the uncertainties in physical models used in various engineering fields, with emphasis on structural mechanics models. These methods enable the rigorous assessment of risk and safety for engineering systems that supports rational decision-making under uncertainty.

The framework of Bayesian statistics has been much used for a decade in the context of verification and validation (V&V), i.e. the calibration of computational codes (e.g. finite element models in structural mechanics) through experimental measurements. Numerical challenges remain though, since classical techniques (e.g. Markov chain Monte Carlo simulation) are highly demanding in terms of computation time.

Similar algorithms may be used to solve stochastic inverse problems, i.e. problems for which the model input parameters are not directly measurable and should be identified from measurements of dependent quantities in the presence of uncertainty. The thesis will explore new approaches to tackle these challenging problems, taking full advantage of the recent developments in high performance computing.

The ideal candidate (m/f) is a communicative scientist with a strong background in civil or mechanical engineering, computational science, applied mathematics, statistics or a similar discipline. Fluent English and good writing skills are required. Special consideration will be given to candidates with a mix background in engineering, statistics and scientific computing. The position is available as of October 1st, 2012.

Applications with a resume, a letter of interest and at least two reference contacts should be sent online until July 31, 2012 to: ETH Zurich, Mr. Hans-Peter Widmer, Human Resources, 8092 Zurich.

Salary: According to ETH Zurich standards, the gross salary for PhD students ranges from CHF 69'000 for the first year to CHF 79'000 for the third year.

Online information: <http://internet1.refline.ch/845721/1987/++publications++/1/index.html>

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