

PhD Position

“Polynomial chaos expansions for uncertainty quantification in nonlinear structural systems”

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.

Uncertainty is ubiquitous in the design and analysis of engineering structures and systems. Advanced methods for representing the sources of uncertainty and propagating them through computational models are necessary for designing safe and robust structures under cost constraints. In this context, polynomial chaos (PC) expansions have emerged as a powerful tool for propagating the parameter uncertainties through the computational models and solve typical questions of *safety* (“what is the probability of failure of the system?”), *sensitivity analysis* (“what are the important parameters that drive the system behavior?”) and *decision-making* (“what is the best scenario / compromise between cost and safety?”).

Hot topics in the field are the development of sparse PC representations for nonlinear and non-smooth computational models (e.g. buckling of structures, response to earthquakes), error estimators, application of PC surrogates in structural reliability and account for epistemic uncertainty.

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/845721/1988/++publications++/1/index.html>

For additional information please contact Bruno SUDRET (sudret@ibk.baug.ethz.ch), Institute of Structural Mechanics, Chair of Risk, Safety and Uncertainty Quantification.