Chair of Computational Modeling and Simulation
TUM School of Engineering and Design
Technical University of Munich

Model Order Reduction for Uncertainty Quantification

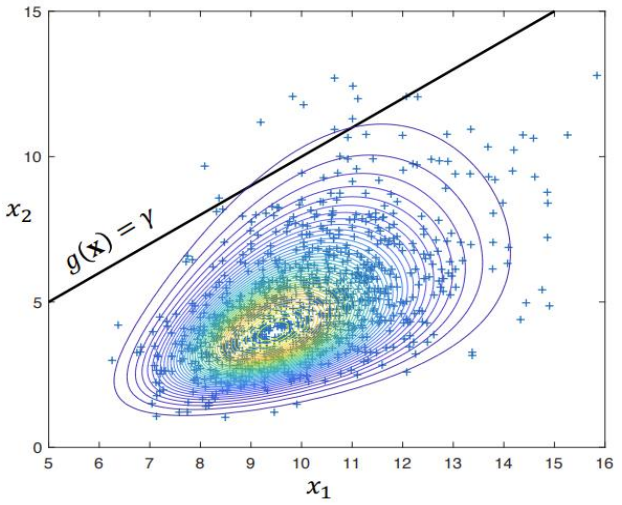
Project Characteristics

Modeling:
Mathematics:
Programming:
Science:

Task

Implement a model order reduction approach with a finite element library for Monte Carlo-based uncertainty quantification.

- Get familiar with sfepy library to perform stationary (time-invariant) finite element analysis
- Implement basic Monte Carlo method using sfepy to quantify the uncertainty of the response of the structure
- Construct reduced-order model in sfepy using proper orthogonal decomposition (POD) based on snapshots of the response
- Compare response of the reduced order model with the full model in context of structural reliability



Monte Carlo samples.

Error and cost of reduced model.

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