Reliability analysis and updating of deteriorating systems with subset simulation - DTU Orbit

Reliability analysis and updating of deteriorating systems with subset simulation
An efficient approach to reliability analysis of deteriorating structural systems is presented, which considers stochastic
dependence among element deterioration. Information on a deteriorating structure obtained through inspection or
monitoring is included in the reliability assessment through Bayesian updating of the system deterioration model. The
updated system reliability is then obtained through coupling the updated deterioration model with a probabilistic structural
model. The underlying high-dimensional structural reliability problems are solved using subset simulation, which is an
efficient and robust sampling-based algorithm suitable for such analyses. The approach is demonstrated in two case
studies considering a steel frame structure and a Daniels system subjected to high-cycle fatigue.

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