Experiences with Large-Scale Probabilistic Reliability Assessment and Information Retrieval

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Abstract: An numerical example arising from probabilistic reliability assessment of a largescale finite element model of a structure using the Monte Carlo method and Importance Sampling will show the efficiency of iterative solvers for problems with multiple right-hand sides.

Furthermore, numerical linear algebra, especially Singular Value Decomposition (SVD) is used as a basis for information retrieval in the retrieval strategy called Latent Semantic Indexing. Our numerical experiments pointed out, that some kind of dimension reduction, which is applied to the original data (for instance digital images) brings to the information retrieval the following two main advantages: (i) automatic noise filtering and (ii) naturally clustering of data with "similar" semantic without data pre-processing.

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