

UNCERTAINTY MODELING FOR ROBUST VERIFIABLE DESIGN

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Safety studies in structural engineering are supposed to guard against failure in all reasonable situations encountered during the lifetime of a structure. Traditionally, the information about uncertainty is summarized in form of either probability distributions (stochastic model), worst case bounds (interval model), or parameterized families of bounds (fuzzy set model).

A recent new representation is in the form of clouds. Clouds allow the representation of incomplete stochastic information in a clearly understandable and computationally attractive way. They describe the rough shapes of typical samples of various size, without fixing the details of the distribution. The use of clouds permits a worst case analysis without losing track of important probabilistic information.

The lecture describes some of the implications for uncertainty modeling with distributions, intervals, fuzzy sets, and clouds.