

Elements of Uncertainty Modeling

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Thanks to progress in solving (at least numerically) many practice-driven problems, a new stage of modeling can be approached – uncertainty modeling. Although considering some amount of uncertainty in model inputs is not a new idea and some sort of uncertainty analysis has been an established part of engineering designs or financial modeling, for instance, a rigorous uncertainty analysis coupled with demanding state problems is a rather new and momentum gaining field of research. Approaches to uncertainty modeling span from stochastic methods based on input data weighted by its probability to deterministic methods where nonstochastic or even no weights of inputs are considered. In the lecture, different approaches to uncertainty analysis and uncertainty propagation modeling will be presented. Particular attention will be paid to differential equations depending on uncertain functions.