
Uncertainty quantification in PDE-based inverse problems

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Optimality is guiding and controlling, in one way or the other, the rise of science and technology. Formulation of the optimality criteria differs from specific problems and research domains and it is often hidden in many engineering problems. We will discuss uncertainty sources and analyze methodologies such that optimal experimental design that maximizes the value of data for statistical inference and prediction, which is particularly important for experiments that are time consuming or expensive to perform like PDE-based inverse problems. In the context of partial differential equations (PDEs), we will expose the tremendous advantage of the continuation method.