

# Robust Parameter Design Optimization of Simulation Experiments Using Stochastic Perturbation Methods

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## Abstract

Stochastic perturbation methods can be applied to problems for which either the objective function is represented analytically, or the objective function is the result of a simulation experiment. The Simultaneous Perturbation Stochastic Approximation (SPSA) method has the advantage over similar methods of requiring only 2 measurements at each iteration of the search. This feature makes SPSA attractive for robust parameter design problems where some factors affect the variance of the response(s) of interest. In this paper, the feasibility of SPSA as a robust parameter design optimizer is presented, first when the objective function is known, and then when the objective function is estimated by means of a discrete-event simulation.

**Keywords:** Simulation Optimization, Noise Factors, Crossed Arrays, Non-homogeneous variance.