



## Pattern Search Ranking and Selection Algorithms for Mixed-Variable Optimization of Stochastic Systems

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Biblioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x15 mm. This item is printed on demand - Print on Demand Neuware - A new class of algorithms is introduced and analyzed for bound and linearly constrained optimization problems with stochastic objective functions and a mixture of design variable types. The generalized pattern search (GPS) class of algorithms is extended to a new problem setting in which objective function evaluations require sampling from a model of a stochastic system. The approach combines GPS with ranking and selection (RS) statistical procedures to select new iterates. The derivative-free algorithms require only black-box simulation responses and are applicable over domains with mixed variables (continuous, discrete numeric, and discrete categorical) to include bound and linear constraints on the continuous variables. A convergence analysis for the general class of algorithms establishes almost sure convergence of an iteration subsequence to stationary points appropriately defined in the mixed-variable domain. Additionally, specific algorithm instances are implemented that provide computational enhancements to the basic algorithm. Implementation alternatives include the use of modern RS procedures designed to provide efficient sampling strategies and the use of surrogate functions that augment the search by approximating the unknown objective function with nonparametric response surfaces. In a computational evaluation, six variants of...

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