Hindawi Publishing Corporation
Journal of Applied Mathematics
Volume 2013, Article ID 949131, 2 pages
http://dx.doi.org/10.1155/2013/949131

Editorial
Stochastic Optimization: Theory and Applications

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Received 23 October 2013; Accepted 23 October 2013

As an important branch of applied mathematics, optimization theory, especially stochastic optimization, becomes an important tool for solving multiobjective decision-making problems in random process recently. Many kinds of industrial, biological, engineering, and economic problems can be viewed as stochastic systems, for example, area of communication, gene, signal processing, geography, civil engineering, aerospace, banking, and so forth. Stochastic optimization is suitable to solve the decision-making problems in these stochastic systems.

This special issue includes 16 high-quality peer-reviewed papers that deal with different aspects of stochastic optimization problems. These papers contain some new, novel, and innovative techniques and ideas. We hope that all the papers published in this special issue can stimulate the continuing efforts to understand this field, particularly new stochastic optimization algorithms and new applications in related fields.

In the paper entitled "*Qualitative and quantitative integrated modeling for stochastic simulation and optimization*," the authors propose a qualitative and quantitative combined modeling specification based on a hierarchical model structure framework. The new modeling approach is based on a hierarchical model structure which includes the meta-meta model, the metamodel, and the high-level model.

In the paper entitled "*Estimating time-varying beta of price limits and its applications in China stock market*," the authors propose an estimation method of time-varying beta of price limits. It uses China stock market trading data to estimate time-varying beta and researches on systemic risk in China stock market.

In the paper entitled "*Doubly constrained robust blind beamforming algorithm*," the authors propose doubly constrained robust least squares constant modulus algorithm (LSCMA) to solve the problem of signal steering vector mismatches via the Bayesian method and worst-case performance optimization, which is based on the mismatches between the actual and presumed steering vectors. A theoretical analysis for the proposed algorithm in terms of complexity cost, convergence performance, and SINR performance is presented in this paper.

In the paper entitled "*Smoothing techniques and augmented Lagrangian method for recourse problem of two-stage stochastic linear programming*," the authors apply the smoothing techniques and a fast Newton-Armijo algorithm for solving an unconstrained smooth reformulation of this problem. Computational results and comparisons are given to show the effectiveness and speed of the algorithm.

In the paper entitled "*New results on robust stability and stabilization of linear discrete-time stochastic systems with convex polytopic uncertainties*," the authors propose new delay-dependent mean square robust stability conditions for linear polytopic delay-difference stochastic equations with interval time-varying delays in terms of LMIs. An application to robust stabilization of linear discrete-time stochastic control systems is given in this paper.