

ABSTRACTS

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a time multistage environment. For this purpose a scheme for scenario tree generation is developed. We use ANN schemes to estimating a so-called scenario pattern of the parameters realizations. The pattern is perturbed by controlled simulations of the residual deviations to generate the scenario tree. The water value function at the end of the short term horizon (included by the implementable time periods) is crucial for obtaining the optimal power unit commitment. The water value refers to the thermal-based future cost savings for current water storage in the reservoirs. For obtaining it we use the scenario tree information along the time horizon. A stochastic dual dynamic programming scheme is presented for solving 2-stage stochastic programming problems in a back-to-front approach until obtaining the water value function for the last implementable time period. An approach is presented for obtaining the sample size and selection of the water storage reference levels in the reservoirs where appropriate perturbations will be used. Computational experience is reported.

11.7. Aspects of stochastic programming applications II.

A stochastic programming approach to robust model predictive control

STEINBACH Marc C.

Robust control strategies are required when the desired trajectory of a process comes close to hard constraints. Worst case approaches (like differential games) can guarantee safe operation in such situations, but they are often overly conservative.

The lecture presents an alternative approach based on multi-stage stochastic optimization problems, which minimizes the expected cost but satisfies all restrictions even in the worst case.

A highly efficient numerical approach for the resulting large stochastic programs is presented, and typical properties of the moving horizon stochastic control problem are discussed whose exploitation yields substantial savings of memory and CPU time.

Hedging oil industry logistics decisions via stochastic programming

MEDOVA Elena A.

The volatility of crude oil prices has a significant impact on the planning decisions and budgets of oil companies. Considering such major activities as supply, storage, transportation and transformation, together with trading on the commodity markets we investigate the influence of random prices and demands on strategic planning decisions. The problem is formulated as a dynamic stochastic programme leading to robust first stage solutions in the presence of price and demand uncertainty. We illustrate the importance of coordination between logistics and financial planning on the example of the Metallgesellschaft collapse and investigate the corresponding trading environment and hedging policies.

A remark on empirical estimates in stochastic programming

KANKOVA Vlasta

A lot of economic, social, engineering, medical as well as financial activities lead (from the mathematical point of

view) to optimization problems depending on a probability measure. If this measure is known, then such problem belongs to the class of nonlinear (deterministic) programming problems. However, in applications mostly the measure has to be replaced by some its statistical estimate. In the literature great attention has been already paid to the investigation of the corresponding statistical estimates of the optimal value and the optimal solution.

In the contribution we shall deal with the second case. In particular, we consider the case when an empirical measure substitutes the theoretical one. Special attention will be paid to the problems depending on probability multifunctions (problems with probability constraints and problems with probability maximization). We generalize by this some well-known results to some other types of the stochastic programming problems.

11.8. Internet applications

An application of the internet technologies in activities of the faculty of science in Kragujevac *KAPLAREVIC Ana M. - PAREZANOVIC Dusko M.*

This paper considers using of the Internet technologies in education and business processes at universities.

Based on the experience reached in the information systems development using classical methods, this paper will present new methodology for development, designing and realization of the information system in a business processes at the universities. Methodology is based on the use of the Internet technologies with distributed work and multimedial interface.

Realization of the information system according to suggested methodology will be presented in this paper, as well as the example of using the Internet services in teaching process at the Institute for mathematics and informatics of the Faculty of science in Kragujevac.

Virtual office for managers

MILOSEVIC Sladjana

Internet has made a significant influence on management. For better use of the Internet and its services in management this influence has to be systematically researched and conducted so that it can give benefits in achieving managerial goals.

In this paper changes in management caused by using of the Internet are discussed. Internet is used by all management levels: top, middle and operative. In that purpose many solutions have been developed with an aim to support using of the Internet and World Wide Web in management. With them, collaboration, communication, document management and other management tasks are made quite easier to be done. Still, none of them offers structured and classified information so that they could be used by separate management levels. An author's solution in a form of virtual office for managers presented in this paper is developed for different management levels. It offers different information sources that are to be used for top and partly middle management. Middle and operative management use information from developed internal information system.