ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

17. Control Theory and Optimization

1991 MS Classification: 49, 60, 90

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Perturbation Analysis of Stochastic Programming Problems

A class of stochastic programming problems, i. e., of optimization problems containing integral functionals in the objective and constraints, is considered. A canonical distance of probability measures is associated with a given stochastic program that leads in a natural way to quantitative continuity properties of its minima and minimizers when the underlying probability distribution is subjected to perturbations. It is shown that this methodology applies to (mixed-integer) two-stage, multi-stage and chance constrained models. It allows various conclusions e. g. on designing approximation schemes and on convergence rates for empirical approximations.