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Expected residual minimization method for stochastic linear complementarity problems.

(English) Zbl 1162.90527
Math. Oper. Res. 30, No. 4, 1022-1038 (2005).

Summary: This paper presents a new formulation for the stochastic linear complementarity problem (SLCP), which aims at minimizing an expected residual defined by an NCP function. We generate observations by the quasi-Monte Carlo methods and prove that every accumulation point of minimizers of discrete approximation problems is a minimum expected residual solution of the SLCP. We show that a sufficient condition for the existence of a solution to the expected residual minimization (ERM) problem and its discrete approximations is that there is an observation omega^i such that the coefficient matrix M(omega^i) is an R_0 matrix. Furthermore, we show that, for a class of problems with fixed coefficient matrices, the ERM problem becomes continuously differentiable and can be solved without using discrete approximation. Preliminary numerical results on a refinery production problem indicate that a solution of the new formulation is desirable.

MSC:

90C15 Stochastic programming
90C33 Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)

Keywords:

stochastic linear complementarity problem; NCP function; expected residual minimization

Full Text: DOI