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Use the Null Space to Create Starting Point for Stochastic Programming

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Abstract : Stochastic programming is one of the powerful technique which is used to solve real-life problems. Hence, the data of real-life problems is subject to significant uncertainty. Uncertainty is well studied and modeled by stochastic programming. Each day, problems become bigger and bigger and the need for a tool, which does deal with large scale problems, increase. Interior point method is a perfect tool to solve such problems. Interior point method is widely employed to solve the programs, which arise from stochastic programming. It is an iterative technique, so it is required a starting point. Well design starting point plays an important role in improving the convergence speed. In this paper, we propose a starting point for interior point method for multistage stochastic programming. Usually, the optimal solution of stage k+1 is used as starting point for the stage k. This point has the advantage of being close to the solution of the current program. However, it has a disadvantage; it is not in the feasible region of the current program. So, we suggest to take this point and modifying it. That is by adding to it a vector in the null space of the matrix of the unchanged constraints because the solution will change only in the null space of this matrix.

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