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Multi-stage stochastic optimization with time-consistent risk constraints

Prof. Darinka Dentcheva

Department of Mathematical Sciences

Steven Institute of Technology

Castle Point on Hudson, Hoboken, NJ

e-mail: darinka.dentcheva@stevens.edu

Abstract: We discuss ways to compare random sequences in the context of multistage stochastic optimization problems. While various comparisons of stochastic sequences have been proposed in the literature, their integration in a sequential decision problem is non-trivial and usually results in a time-inconsistent evaluations and inconsistent decisions. We propose a framework for constructing stochastic orders that enable time-consistent comparisons at any stage of the decision process and ensure the dominance property of the optimal policy. Particular attention is paid to constraints based on stochastic dominance of the second order imposed conditionally. This comparison reflects risk-averse preferences and results in problems amenable to numerical treatment. We shall present optimality condition for the new problems and shall discuss their relations to other risk models. Numerical methods for solving the multi-stage problem are outlined.

Wednesday, March 15, 2023 - 11:30-12:30

Room B 103, School of Engineering, Dalmine (BG)

Contact info: Prof. Francesca Maggioni (francesca.maggioni@unibg.it)