Industrial & Systems Engineering
Seminar Announcement

Ambiguous Risk Constraints with Moment and Unimodality Information

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Abstract: Optimization problems face random constraint violations when uncertainty arises in constraint parameters. Effective ways of controlling such violations include risk constraints, e.g., chance constraints and conditional Value-at-Risk (CVaR) constraints. In this talk, we discuss these two types of risk constraints when the probability distribution of the uncertain parameters is ambiguous. In particular, we assume that the distributional information consists of the first two moments of the uncertainty and a generalized notion of unimodality. We find that the ambiguous risk constraints in this setting can be recast as a set of second-order cone (SOC) constraints. In order to facilitate the algorithmic implementation, we also derive efficient ways of finding violated SOC constraints (also known as the separation procedure). We demonstrate the theoretical results via a computational case study on power system operations. This is a joint work with Bowen Li and Johanna L. Mathieu.

Bio: *Ruiwei Jiang* is an Assistant Professor of Industrial and Operations Engineering in the University of Michigan at Ann Arbor. His research interests include stochastic optimization and integer programming. Applications of his work include power and water system operations, renewable energy integration, and healthcare operations management. Recognition of his research includes the Stochastic Programming Society student paper award and the INFORMS George E. Nicholson student paper award.

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