The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics and Operations Management
Dept of Industrial Engineering & Decision Analytics
Joint Seminar Announcement

Ambiguity Updating Robust Architecture: Updating Ambiguity Sets with Revealed Uncertainty in Multi-period DRO

by

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Date	:	**26 August 2025 (Tuesday)**
Time	:	**10:30 – 11:45 AM**
Venue	:	**Case Room 1001, 1/F, LSK Business Building**

Abstract:

We study the context of multi-period distributionally robust optimization, where uncertainties are revealed sequentially and the decision-maker wishes to re-solve the problem-to-go, utilizing this information to shrink the ambiguity set of distributions-to-go, while remaining consistent with the original ambiguity set. We propose a model, termed Ambiguity Updating Robust Architecture (AURA), that defines the ambiguity sets for the problems-to-go. Here, AURA does not require uncertainties to be independent across time, or explicit characterization of the conditional distribution of the uncertainties on those at prior times. We show that the robust counterpart of AURA can be computed and results in a deterministic dynamic program. Under linear assumptions, AURA can be reformulated as a single-period linear optimization model with number of decision variables and constraints that grows quadratically in time.

Bio:

Dr. Gar Goei Loke is an Associate Professor in the Department of Management and Marketing. His research focuses on decision-making under uncertainty, and developing models, frameworks, methods and algorithms that help decision-makers go from data to decisions. In his earlier stream of research, he has applied techniques in robust optimization to the solution of optimization problems in queueing networks. More recently, he is developing and proposing new ways to integrate machine learning and optimization harmoniously. His research is primarily applied to business areas such as service operations management, supply chain management, healthcare operations management, and energy and water. His research has been published in journals such as Operations Research and Manufacturing & Service Operations Management.

All interested are welcome!

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