Séminaire conjoint CIRRELT-HEC Joint Seminar
Département de la gestion des opérations et de la logistique

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Bounded Backward Induction for Max-Min Dynamic Programs

Abstract: Max-min dynamic programs model sequential decision problems where policies are evaluated via the worst-case reward across a set of scenarios representing future uncertainty. In the standard backward induction algorithm for max-min dynamic programs, the size of the decision tree required to identify an optimal policy is often prohibitively large. We introduce a Bounded Backward Induction (BBI) procedure that leverages upper and lower bounds on the reward-to-go to significantly reduce decision tree size. We develop general methods to obtain dual bounds that navigate the tradeoff between quality and computational effort. We also provide general methods to obtain policies with performance guarantees. We refine these methods for budget-style scenario sets. We illustrate BBI via a media selection problem with yield uncertainty. Relative to standard backward induction, BBI identifies optimal policies for problem instances that are orders of magnitude larger.

Bio: Justin Goodson is a professor at Saint Louis University. He holds degrees in management science and industrial engineering from the University of Iowa and University of Missouri. He researches sequential decision problems with uncertain information, focusing largely on problems arising in transportation and logistics. He teaches and consults in the areas of operations research and supply chains analytics.

Lundi / Monday

10 juin 2024, 10 h 30
June 10 2024, 10:30

HEC, Édifice Sainte-Catherine
Salle / Room VILNIUS
1er étage, section verte
1st Floor , Green section

Ouvert à tous / Open to all

Responsable / Organizer

Jorge Mendoza