



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

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ROBUST SPARE PARTS INVENTORY MANAGEMENT

Abstract: We focus on the spare parts inventory control under demand uncertainty, particularly during the New Product Introduction (NPI) phase when historical data is limited. Most conventional spare parts inventory control models assume demand follows a Poisson process with a known rate. However, the rate may not be known when limited data is available. We propose an adaptive robust optimization (ARO) approach to multi-item spare parts inventory control. We show how the ARO problem can be reformulated as a tractable deterministic integer programming problem. We develop an efficient algorithm to obtain near-optimal solutions for thousands of items. We demonstrate the practical value of our model through a case study at ASML, a leading semiconductor equipment supplier. The case study reveals that our model consistently achieves higher service levels at lower costs than the conventional stochastic optimization approach employed at ASML.

Bio: Ahmadreza Marandi is an assistant professor at both the Department of Industrial Engineering and Innovation Sciences and the Eindhoven Artificial Intelligence Systems Institute at Eindhoven University of Technology. His research focuses on leveraging available data to make robust and resilient medium- to long-term decisions and designing algorithms to handle uncertainty. He is an expert in Robust Optimization, and has published in leading journals such as Mathematical Programming and the INFORMS Journal on Computing. His practical research interests lie primarily in supply chain management and high-tech industries. Ahmadreza is also a member of the Scientific Steering Group of the Resilience Engineering Center at 4TU, a consortium of the four Dutch technical universities, and co-organizes the renowned "Robust Optimization Webinars" series.

MARDI / TUESDAY

30 juillet 2024, 10 h 30
July 30th 2024, 10:30

Université de Montréal
Pavillon André-Aisenstadt
Salle / Room 5441

Ouvert à tous / Open to all

Responsable / Organizer
Sonja Rohmer