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Séminaire conjoint CIRRELT, MobilOpt et la Chaire de recherche du Canada en logistique intégrée

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THE TWO-DIMENSIONAL CUTTING PROBLEM WITH USABLE LEFTOVERS AND STOCHASTIC DEMANDS

Abstract: The cutting stock problem is a classical challenge in operations research with strong industrial and environmental relevance. This presentation addresses a variant known as the two-dimensional cutting stock problem with usable leftovers, which involves cutting rectangular plates to produce smaller rectangular items with specific dimensions while minimizing material loss. The planning of this production is carried out considering the possibility of generating unordered leftovers that, if meeting predefined criteria, return to stock to be used in future cutting processes. An exact mathematical model and a heuristic procedure were developed to efficiently generate and allocate cutting patterns, with computational results presented for benchmark and randomly generated instances. The study was also extended to a stochastic setting in which customer demands are uncertain. To address this complexity, a matheuristic was proposed that integrates pattern generation, scenario construction, and a stochastic optimization model solved by both exact and heuristic approaches. Computational experiments show the effectiveness of the proposed methods and provide insights into the role of uncertainty in decision-making.

Short biography: Douglas is a postdoctoral researcher in Operations Research at the University of São Paulo (USP), Brazil, working on a São Paulo Research Foundation (FAPESP)-funded project. He previously held a postdoctoral position at São Paulo State University (UNESP), Brazil. He holds a degree in Information Systems and a PhD in Industrial Engineering from UNESP. Douglas' research focuses on the design and application of mathematical models, heuristics, and matheuristics for complex optimization problems, including cutting stock, lot sizing, and vehicle routing, in both deterministic and stochastic settings. He has also contributed to research projects on staff scheduling and the application of machine learning to demand forecasting.

Zoom: https://ulaval.zoom.us/j/63255262766?pwd=1xtLAj4jI6qVcRgozrb1rcb4Jvv9qL.1
Meeting ID: 632 5526 2766 – **Passcode:** 574816

Mardi / Tuesday
21 octobre / October 21st
10h00

Université Laval
Pavillon Palasis-Prince
Salle / Room 3307

Ouvert à tous / Open to all
Café et viennoiseries

Responsable / Organizer:
Leandro Coelho

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