



APDIO - Associação Portuguesa de Investigação Operacional

Livro de Resumos

Universidade de Aveiro
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5, 6 e 7 de Setembro de 2018



concrete answers. In this work, we present an application of a multiple criteria nominal classification method, designated CAT-SD (inesc-id.pt/publications/13353/pdf), to tackle the problem of migrant accommodation in an Italian city (Turin). As the majority of European cities, Turin offers to migrants temporary places for a limited time span, which are insufficient and inadequate; meanwhile, there are several abandoned buildings that can potentially be used to cover the needs of housing and facility of migrants. Our aim is to contribute for defining an urban strategy and improving the decision-making process regarding the accommodation system. A co-constructive process through an interaction between the analysts and the experts is followed. The CAT-SD method allows to identify the most adequate category or categories (representing distinct migrant status), considering several criteria, for each abandoned building in Turin.

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Sessão W6: Risk Management and Uncertainty Modelling *

5 de Setembro, Quarta-feira, 16:30 - 18:20
Sala: 23.3.15

Moderador: Mário Amorim-Lopes

Conditional Value at Risk (CVaR) as a risk measure to support industrial plant design and scheduling decisions under demand uncertainty

Miguel Vieira, Helena Paulo, Tânia Pinto-Varela, Ana Barbosa-Póvoa

Resumo. Most decisions related to industrial plant design and scheduling, that strongly influences the financial performance of a company, are taken in a complex environment under uncertainty. Mathematical modelling has been used to solve those problems considering stochastic programming, providing an expected objective value which does not allow control over critical probability outcomes. Therefore, the risk assessment can integrate the trade-offs between the given objective and the risk profile of the decision maker. Conditional Value at Risk (CVaR) has demonstrated to be an effective risk metric, though its application in the problems in study is sparse and the influence of the stochastic parameters is often not fully characterized. To address this

problem, a two stage stochastic Mixed Integer Linear Programming model that considers the design and scheduling of a multipurpose batch plant is used. A bi-objective optimization approach maximizes the profit while minimizing the risk using the ϵ -constraint method. The generated Pareto curve is a valuable tool to support the decision-making process, with information about the different possible solutions in terms of profit and respective risk profiles under demand uncertainty. The CVaR dependence of the nature of the stochastic parameters through different scenarios trees is also explored.

Robust Supply Chain Design under Supplier Integration Uncertainty

Nuno Falcão e Cunha, Thiam-Soon Gan, Pedro Amorim, Bernardo Almada-Lobo, Martin Grünow

Resumo. Aerospace OEMs have prioritized the improvement of aircraft efficiency while concurrently reducing non-recurring costs in recent product development programmes. This was achieved by increasing the outsourced components and sharing R&D responsibilities with key suppliers. Suppliers were also asked to pre-assemble and integrate large aircraft systems. Thus, a new class of tier-1 strategic partners emerged and took on the role of "integrators". The aggressive pursuit of this strategy introduced considerable uncertainty as integrators were asked to incorporate unproven technologies to improve aircraft performance. This shift in responsibilities also demanded that suppliers manage their own supply chains independently. We represent the likelihood of a supplier being disrupted due to technical or managerial issues as the supplier's integration risk. We propose a collaborative product and supply chain design (CP-SCD) method for the OEM seeking an efficient supply base under supplier integration risk. Robust optimization is used to mitigate uncertainty and to study how decision makers with different risk aversions should design their supply chains. Furthermore, we investigate how assigning multiple components to the same supplier and selective sourcing flexibility for different components affect the OEM's exposure to risk.

Comparing approaches in Maritime Inventory Routing Problem with uncertainty

Filipe Rodrigues, Agostinho Agra, Lars Magnus Hvattum, Marielle Christiansen

Resumo. Maritime transportation is one of the most common ways to transport goods. However, this kind of transportation is characterized by high levels of uncertainty, since the weather conditions have a great impact in the