based on the value of the information (VOI) but depends also on the attractiveness of the choice set. Subjects overbid moderately when faced with attractive lotteries and strongly when losses can be avoided, even when final wealth positions remain constant. Due to the experimental design this effect cannot be explained by neither risk preferences, loss aversion, prospect theory, nor disappointment theory. Instead, we find regret theory to be the only tested model that can explain the observed behavior. Hence, on the one hand, it may be adventurous for information brokers, such as market research companies or business consultancies, to frame decision situations for buyers of information to increase profits. On the other hand, buyers of information should be aware of this attractiveness bias and focus solely on the value of the information.

4 - Behavioral challenges in policy analysis with conflicting objectives
Gilberto Montibeller

Public policy problems are rife with conflicting objectives: efficiency versus fairness, technical criteria versus political goals, costs versus multiple benefits. Multi-Criteria Decision Analysis provides robust methodologies to support policy makers in making tough choices and in designing better policy alternatives when considering these conflicting objectives. However, there are important behavioural challenges in developing these models, which I will cover in this talk: individual and group behavioural biases and cognitive limitations in providing judgements and interacting with decision analytic models.

■ MB-32

Monday, 10:30-12:00 - SOUTH BUILDING UV S314

Supply Chains

Stream: Routing, Logistics, Location and Transportation
Chair: *Mojtaba Araghi*

1 - Scheduling of pick-up or delivery tasks for autonomous robots via dispatching rules
Azmi Cibi, Tahir Ozdemir, Inci Saricicek, Ahmet Yazici

Automated guided vehicles started to be replaced by autonomous transfer robot systems in the fourth industrial revolution. This transformation increases the flexibility in manufacturing but requires solving scheduling problem for autonomous robots in internal transport environments. The study deals with scheduling of autonomous robots in internal transport environments. Scheduling of pick-up and delivery tasks is essential to the efficiency of the overall manufacturing systems. Dispatching rules are used to generate schedule over a certain horizon period from an hour to a day. Dispatching rules are widely used in warehouses and shop floors to control vehicles' movements. First Come First Served, Earliest Due Date, Shortest Processing Time and combined rules are used in the scheduling of pick-up and delivery tasks of autonomous robots. The performances of proposed dispatching algorithms are evaluated in Gazebo Simulation Environment for a small factory model. The performance criteria are the minimizing the tardy jobs, total tardiness and flow time. The results show that the combined rules can be used when considering multiple objective functions such as minimizing tardy job and minimizing flow times.

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2 - Coverage planning to account for acoustical properties associated with emergency warning sirens
Hiroyuki Goto, Alan Murray

An important class of facility location problems deals with service coverage. While there are many type of coverage models, among the most widely applied is the location set covering problem. It has been used to address a broad range of planning and analysis contexts, including emergency services. In this talk we consider a system consisting of omnidirectional warning sirens. Given a region, we seek the minimum number of sirens needed to alert everyone across the region of an emergency situation. In contrast to previous work, proposed is an approach to take into acoustic properties. This requires formulation of superposition associated with multiple sounds as this impacts audible distance. The developed approach can be considered a generalization of the originally defined location set covering problem. To obtain an optimal solution, a bounding-based method is adopted. Empirical results are presented for the emergency warning siren system in Huntington Beach, California, USA. The findings highlight the significance of acoustic properties, and the need to explicitly account for siren interaction in the evaluation of service coverage.

3 - The impact of sustainable packaging used in land transfer operations
Cristian Camilo Aparicio Peralta, Ana Halabi Echeverry, Cesar Augusto Bernal-Torres

This research identifies the impact of sustainable packaging used in land transfer operations focused on new conditions given by the current land transport environments. At present, logistics operations focused on food transport, faces several difficulties at transfer times in the distribution center or in the final customer point, for instance, each product has qualities that must be preserved by the supply chain (taste, smell, presentation) that can be affected in their storage specially when sharing the storage places at vehicles (perhaps not sustainable). Vehicles with specific characteristics are used for frozen or refrigerated cargo. Therefore, the research contributes to sustainable packaging solutions to the best performance of the packaging considering the transfer restrictions and changes in land transport environments; identifing restrictions in fixed capacity of vehicles, in addition to the sanitary norms, biodegradation and other new sustainable conditions for preserving the food transport.

4 - Optimizing distribution and pricing strategy for a cold chain enhanced by sensor technologies
Mojtaba Araghi, Sara Babaee

We study the problem of optimizing transportation and pricing strategies in a cold supply chain network. Delivering perishable products, the firm faces different deterioration rates depending on the chosen transportation routes. Multiple quality levels of products, resulted from the transportation, are substitutable at the final node based on the firm's pricing strategy. Enhancing the cold chain real-time traceability by using sensor technologies enables the firm to optimize the distribution policy and update it during the course of transportation. We analyze this problem by comparing the optimal transportation and pricing policies under the presence or absence of sensor technologies using mathematical modeling. We discuss how the optimal policies depend on model parameters and evaluate the benefits of integrating the sensor technology in the perishable products supply chain.

■ MB-33

Monday, 10:30-12:00 - SOUTH BUILDING UV S315

Data Mining and Statistics I

Stream: Data Mining and Statistics
Chair: *Florian Hauck*

1 - Application of machine learning-for cost estimation in customized furniture production
Virginijus Marcinkevicius, Viktor Medvedev, Olga Kurasova, Tomas Vedlūga