Universität Karlsruhe (TH)
Fakultät für Wirtschaftswissenschaften

Karlsruhe Institute of Technology

VORträge zum Operations Research

Kolloquium des Instituts für Operations Research

Zeit:	Donnerstag, 7. Juni 2018, 15:00 Uhr
Ort:	Raum 4A-09, Gebäude 05.20
Es spricht:	Prof. Yasel José Costa Salas, FH Oberösterreich
Zum Thema:	**A Hilly City Approach for the Vehicle Routing Problems**

Abstract: One of the main concerns of urban logistics focuses on generating actions aimed at improving cargo transport systems, in such a way that the environmental and social impacts of their operations are reduced. Therefore, the selection of vehicle distribution routes becomes a decisive element not only in reducing costs, operating times and service level, but also in the reducing fuel consumption, emissions of greenhouse gases, pollution and accidents, which makes the problem acquire a sustainable perspective.
Traditionally, it is considered that the shortest route is the one that minimizes the costs, the operation time and the environmental impact of the distribution activities. However, when establishing a route in urban scenarios, it must be taken into account that the route between two points is not necessarily symmetrical because of the infrastructure, the road directions, and the traffic restrictions due to vehicles weight, among others. In addition, in hilly cities, the above conditions also have a high impact, since when a vehicle moves between two points, there are multiple changes of both positive and negative gradients. These considerations make the traditional approach of the problem more complex, owing to the fact that the selection of the shortest route can lead to taking the route with higher road gradients, which directly affects variables such as fuel consumption, emissions and accident risks.
According to the above, we propose a model for the assessment of distribution routes in mountain cities, which has as elements of decision the power required by the vehicle, the amount of fuel consumed and their respective emissions. On the basis of information retrieved from a geographic information system, an origin-destination matrix is estimated, by means of which a topographic profile between nodes is created to analyze the components of uniformly accelerated and uniformly rectilinear movement of the vehicle, starting from variables such as weight, speed of travel and changes in road gradient.
The road gradient plays a fundamental role in the generation of the route, since it is expected that the routes with lower inclinations or descent will be selected, especially when the vehicle has a greater load, in order to decrease the fuel consumption and the quantity of emissions.
In future research lines, it is planned to include the location of the distribution centers within the decisions of the model, taking into account the limitations of size, access, and proximity to the routes with less variation in the gradients of the roads.

Die Vorträge zum Operations Research wenden sich an alle Interessierten!

Bei Rückfragen wenden Sie sich bitte an:
Prof. Dr. Stefan Nickel, Institut für Operations Research.