

Lecture Series of the Research Institute for Supply Chain Management

Monday, January 11 2021, 5.30 pm

The lecture will held online.

Details announced after registration under sekretariat.itl@wu.ac.at



UNIV. PROF. SOPHIE PARRAGH, PHD.:

“BRANCH-AND-CUT BASED BI-OBJECTIVE OPTIMIZATION: FROM STOCHASTIC FACILITY LOCATION TO MULTIMODAL CAR-SHARING”

Many if not all practical problems involve several and often conflicting objectives. Prominent examples are environmental concerns versus cost or customer satisfaction versus profitability. Whenever multiple conflicting objectives are of concern, it is usually not possible to identify one best solution with respect to all of the considered goals. Rather, a set of optimal compromise solutions exists which are “better” than the other possible solutions and incomparable among each other. Each such solution represents a possible trade-off.

In this talk, we model and solve a bi-objective stochastic facility location problem, arising, for example, in the context of disaster relief logistics, and a bi-objective multimodal car-sharing problem. In both problems, a cost objective and a user or beneficiaries oriented objective are considered concurrently. From a methodological point of view, we develop two different approaches. In the first, the bi-objective nature of the problem is addressed within a branch-and-bound based algorithm, integrating Benders type decomposition (also known as the L-shaped method for stochastic programming) so as to effectively address the stochastic nature of the problem. In the second, a criterion space search framework is used and the resulting single-objective optimization problems are solved by means of a tailored branch-and-cut algorithm. We discuss advantages and drawbacks of the two approaches and we analyze the trade-off relationship between the considered objectives.

Sophie N. Parragh is head of the Institute of Production and Logistics Management at Johannes Kepler University Linz. She is program director of the master program "Economic and Business Analytics", member of the dean team of the JKU Business School and she serves as associate editor at INFORMS Journal on Computing. Her research is centered around the development of efficient algorithms for optimization problems with single and multiple objectives, involving facility location, vehicle routing or scheduling decisions.

For further information, please contact sekretariat.itl@wu.ac.at