DOCTORAL PROGRAM
DISCRETE MATHEMATICS
TU & KFU GRAZ · MU LEOBEN
AUSTRIA

Graz University of Technology

Institut für Diskrete Mathematik

**Seminar für Kombinatorik und Optimierung**

8.2.2021, 10:00 (on time)

Webex virtual meeting

# Robust Combinatorial Optimization with Locally Budgeted Uncertainty

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Abstract:

Budgeted uncertainty sets have been established as a major influence on uncertainty modeling for robust optimization problems. A drawback of such sets is that the budget constraint only restricts the global amount of cost increase that can be distributed by an adversary. Local restrictions, while being important for many applications, cannot be modeled this way. We introduce new variant of budgeted uncertainty sets, called locally budgeted uncertainty. In this setting, the uncertain parameters become partitioned, such that a classic budgeted uncertainty set applies to each partition, called region. In a theoretical analysis, we show that the robust counterpart of such problems for a constant number of regions remains solvable in polynomial time, if the underlying nominal problem can be solved in polynomial time as well. If the number of regions is unbounded, we show that the robust selection problem remains solvable in polynomial time, while also providing hardness results for other combinatorial problems. In computational experiments using both random and real-world data, we show that using locally budgeted uncertainty sets can have considerable advantages over classic budgeted uncertainty sets.

Joint work with Marc Goerigk.

Meeting will be started at 9:30 a.m. for an informal chat. Talk starts at 10:00 a.m.

https://tugraz.webex.com/tugraz/j.php?MTID=mb765ef4d86be77e471697fd82e2c87d7

Meeting number (access code): 121 851 5144, password: SYcE864R4mp

Eranda Dragoti-Çela and Bettina Klinz