technische universität dortmund

RTG 1855

Min-max-min Robust Optimization for the Capacitated Vehicle Routing Problem

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Abstract:

The idea of k-adaptability in two-stage robust optimization problems is to calculate a finite number of k second-stage policies here-and-now before the uncertain scenario is known. After the scenario is revealed the best of these k policies can be used. This idea leads to a min-max-min problem. We consider the case where no first stage variables exist and propose to use this model to solve combinatorial optimization problems. In the case of a convex uncertainty set, in contrary to the general two-stage robust approach, we are able to show that our problem is as easy as the underlying certain problem if k is greater than the number of variables and if we can optimize a linear function over the uncertainty set in polynomial time.

In this talk we also provide an algorithm to solve latter approach for the capacitated vehicle routing problem with ellipsoidal und polyhedral uncertainty in the objective function.