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New Models and Methods in Robust Combinatorial Optimization

Abstract:

We survey a number of new models of robust combinatorial optimization. We mainly, but not exclusively, focus on adversarial deletion problems: Given a nominal instance of a combinatorial optimization problem and a set of scenarios, each comprised of a subset of resources (e.g., edges of a graph), the goal is to choose a solution X with the property that X-S (i.e., the solution X without the resources in S) satisfies some feasibility criterion, for every scenario S. Different definitions of the feasibility criterion, and different presentations of the scenario set give rise to a variety of largely-unexplored models.