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Approximability of the robust representatives selection problem. (English) Zbl 1408.90256

Summary: In this paper new complexity and approximation results on the robust versions of the representatives selection problem, under the scenario uncertainty representation, are provided, which extend the results obtained in the recent papers by A. Dolgui and S. Kovalev [4OR 10, No. 2, 181–192 (2012; Zbl 1266.90191)] and V. G. Deineko and G. J. Woeginger [4OR 11, No. 3, 249–252 (2013; Zbl 1287.90085)]. Namely, it is shown that if the number of scenarios is a part of input, then the min-max (regret) representatives selection problem is not approximable within a ratio of $O(\log^{1-\epsilon} K)$ for any $\epsilon > 0$, where $K$ is the number of scenarios, unless the problems in NP have quasi-polynomial time algorithms. An approximation algorithm with an approximation ratio of $O(\log K / \log \log K)$ for the min-max version of the problem is also provided.

MSC:
90C27 Combinatorial optimization
90C35 Programming involving graphs or networks
90C10 Integer programming

Keywords:
robust optimization; selection problem; uncertainty; computational complexity

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References:

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