ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

17. Control Theory and Optimization

1991 MS Classification: 5, 49, 90

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Complexity of vector spanning trees problems with topological criteria

Let $G = (V, E)$ is n - vertices 2 - weighted graph, $X = \{x\}$ is its spanning tree; $X = X(G) = \{x\}$ is the set of all spanning trees of graph G. The vector objective function (VOF) $F(x) = (F_1(x), F_2(x))$, $F_\nu(x) \to \min, \nu = 1, 2$ is determined on X. VOF determines Pareto set $\widetilde{X}$ and a complete set of alternative (CSA) X^0, $X^0 \subseteq \widetilde{X} \subseteq X$. CSA X^0 is unknown solution of problem. Finding CSA has exponential computing complexity in case when criteria $F_\nu(x), \nu = 1, 2$ represents sum of weights of edges $e \in E_x$. We consider such problems: VOF contains if only one topological criterion: diameter of a tree or its degree. Then 2 criteria spanning trees problem is NP - hard.

Reference: Emelichev V. A. and Perepelitsa V. A., Multiobjective Problem on the Spanning Trees of Graf, *Soviet Math. Dokl.* , Vol. **37** (1988) N1, 114-117.