

# ALGORITHMS WITH PERFORMANCE GUARANTEES FOR SOME HARD PROBLEMS ON GRAPHS <sup>1</sup>

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The report gives an overview of some results obtained for the past five years by the author and his colleagues at the Institute of Mathematics SB RAS. It's about developing efficient algorithms with performance guarantees for solving such hard problems of discrete optimization and operations research as the routing problem, the multi-index planar assignment problem, clustering problem, facility location problem on graphs and networks, etc. Often discrete optimization problem on a graph associated with finding a subgraph of extreme total weight. Some of these problems are solvable in polynomial time, for example, the problem of finding the minimum-weight spanning tree problem. Examples of intractable problems of this kind are the traveling salesman problem and searching clique of a given size. Recently time attention has been paid to the study of problems in which you want to find in the complete weighted graph several edge-disjoint objects (such as a Hamiltonian cycle, substitution, cliques, spanning trees). Some of these extended problems remain effectively solvable (eg, the problem of finding multiple edge-disjoint spanning trees of minimum total weight). However, most of problems are NP-hard, and because to address them is urgent to develop efficient (polynomial) algorithms with the performance guarantees. Some examples of such algorithms are given in [1-5].

## REFERENCES

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