

Comments on: Static and dynamic source locations in undirected networks

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The authors present an excellent survey on the source location problem starting by placing the problem between the well-known maximum flow problems and the facility location problems. The connections and differences between these problems are also very well stated. The *Source Location Problem* is defined over an edge-capacitated graph with node demands and costs for opening sources at these nodes. The problem is finding the best (with minimum cost) combination of source locations so that the maximum flow value between these locations and any other node is at least as large as the demand of the node.

The authors first categorize the existing literature under the *static source location problems* and then propose *dynamic source location problems* to the literature by allowing time-dependent parameters on the underlying network. One remark here is that, the demand of the nodes is assumed to be “sort of” cumulative during the planning horizon and the time dependency is mainly due to incorporating the travel time between nodes of the network.

As clearly explained by the paper, for static source location problems, single and plural cover versions have been defined in the literature. In the single cover version, each node is restricted to receive all its demand from a single source whereas in plural covering version nodes can be receiving their demands from multiple sources. For both single and plural covering versions of the static source location problems, simultaneous and nonsimultaneous versions are also defined. In the nonsimultaneous version, each nodes demand is satisfied as if it is the only demand node in the network,

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i.e. without sharing the edge capacities. In the simultaneous version, all demands are to be satisfied at the same time, meaning that edge capacities are shared.

In the first half of the paper, the authors first review the existing literature on the static and plural covering static source location problems. Then, for single covering problems, the authors extend results from literature and derive a primal-greedy algorithm to find all minimal deficient sets. For the plural covering, the authors derive some additional properties and (pseudo)polynomial algorithms when the underlying network is in the form of a tree.

This paper also introduces the *dynamic source location problem* to the literature. This is a very nice contribution as the potential applications of the source location problems increase with the inclusion of the time varying parameters. The immediate application area of the source location problems is the distribution networks in which “customers” need to be served their demand via warehouses or distribution centers. With the dynamic source location problem defined, the time it takes to travel between nodes will also be taken into consideration.

One important additional application area would be in the relief logistics. Especially after large and disruptive disasters, usually roads are blocked by debris which need to be cleared before the transportation of supplies or aid can be distributed to disaster affected areas or shelter sites (Celik et al. 2015; Ozdamar and Ertem 2015). Of course it is very crucial to satisfy the needs of the areas (satisfy the demands of the nodes) from potential suppliers (sources to be located) but the underlying transportation network is blocked and unblocking times should be considered during the source selections. Thus, relief logistics over debris blocked network is a nice application area for the dynamic source selection problem.

It would be nice to see the validity of the definitions and the algorithms of the paper when the objective is not minimizing cost but, say, maximizing some sort of a utility function. Especially for humanitarian problems, maximizing utility is more important than minimizing cost and extending the results of this paper towards different objectives would be another nice contribution.

In conclusion, the paper is clear, well written and presents a comprehensive survey on static source location problems, extends some well-known results from the literature and proposes dynamic source location problems to the literature which I believe is a very nice contribution. The wide range list of references is also very helpful for researchers in the field.

References

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