

Separation of partition inequalities for the (1, 2)-survivable network design problem

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Abstract

Given a graph $G = (V, E)$ with edge costs and an integer vector $r \in \mathbb{Z}_+^V$ associated with the nodes of V , the survivable network design problem is to find a minimum cost subgraph of G such that between every pair of nodes s, t of V , there are at least $\min\{r(s), r(t)\}$ edge-disjoint paths. In this paper we consider that problem when $r \in \{1, 2\}^V$. This case is of particular interest to the telecommunication industry. We show that the separation problem for the so-called partition inequalities reduces to minimizing a submodular function. This yields a polynomial time separation algorithm for these inequalities in that case.