

Polyhedral Result for the Bipartite Induced Subgraph Problem

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Abstract

Given a graph $G = (V, E)$ with node weights, the Bipartite Induced Subgraph Problem (BISP) is to find a maximum weight subset of nodes V' of G such that the subgraph induced by V' is bipartite. In this paper we study the facial structure of the polytope associated with that problem. We describe two classes of valid inequalities for this polytope and give necessary and sufficient conditions for these inequalities to be facet defining. For one of these classes, induced by the so-called wheels of order q , we give a polynomial time separation algorithm. We also describe some lifting procedures and discuss separation heuristics. We finally describe a Branch-and-Cut algorithm based on these results and present some computational results.