Combinatorial Optimization Project

December 8, 2017

Edmonds' Blossom Algorithm

In class we presented Edmonds' blossom algorithm. The algorithm, as it is, takes $O(n^2m)$ time, where m is the number of edges and n is the number of vertices.

By using a more sophisticated data structure (i.e., Union-and-Find), one can speed up the algorithm considerably, namely, to $O(nm \log n)$ time. A very succinct description of such implementation can be found in the book "combinatorial optimization" by Cook, Cunningham, Pulleyblank, and Schrijver (see pages 140-141).

Alternatively, one can also have an $O(n^3)$ algorithm without using such data structures. See the book "combinatorial optimization, polyhedra and efficiency" by Schrijver (see Section 24.2a).

In this project, you are expected to implement one of the two above algorithms. Please perform experiments and write a 3-4 page report.