ANTE CUSTIC, Simon Fraser University

Algorithms for 2-median problems on trees with small number of leaves

Given a tree with weights assigned to vertices and lengths to edges, the $p$-median problem on trees is a problem of finding $p$ locations in the tree, so that the sum of weighted distances to the closest location for all vertices is minimized. Optimal solution for $p = 1$ is the weighted centroid of a tree, which can be found in $O(n)$ time, while best known bound for $p = 2$ is $O(n \log n)$ which is given by Gavish and Sridhar in 1995. In this talk we improve this result when the number of leaves is small, i.e. we present $O(n \log s)$ time algorithm for the 2-median problem on trees, where $s$ denotes the number of leaves. Furthermore, we give $O(n \log s)$ algorithms for the generalizations of the 2-median problems on trees, when two medians need to satisfy distance and eccentricity constrains, respectively. This is a joint work with Rashmisnata Acharyya and Binay Bhattacharya.