Title: Drawing polygons on points

Abstract

Given a set of points in the plane, we want to partition them into disjoint polygons of arbitrarily specified sizes. We will show that if such a partition exists, it can be constructed in polynomial time. This problem is equivalent to finding a specified 2-factor in the visibility graph of the point set. The characterization for the case where all cycles have length 3 also translates to finding a K_3-factor of the visibility graph of the point set. We will show that the generalized problem of finding a K_k-factor of the visibility graph of a given point set for k ≥ 5 is NP-hard.

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