

On High Connectivity Triangulation of Planar Point Sets

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Abstract

In this lecture, we consider the problem of determining in polynomial time whether a given planar point set P of n points in general position admits a 4 – *connected* triangulation. We present a necessary and sufficient condition for recognizing such point sets P , and design an $O(n^3)$ time algorithm for constructing a 4 – *connected* triangulation of P , if it exists. Thus, our algorithm solved a longstanding open problem in computational geometry and geometric graph theory.

We also provide a simple $O(n^2)$ time method for constructing a non-complex triangulation of P , if it exists. This method provides a new insight into the structure of 4 – *connected* triangulations of point sets.

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