An Upper Bound for Conforming Delaunay Triangulations

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A plane geometric graph C in R^2 *conforms* to another graph G if each edge in G is an edge in C or is a union of some edges in C. Problem: Given a graph G with n vertices and m edges, insert vertices (and edges) to obtain a Delaunay Triangulation C that conforms to G. The paper[1] gives the first upper bound on the number of points necessary for a conforming triangulation that is polynomial in the size of the constraining graph. It is proved that for every graph G with n vertices and m edges, there is a Delaunay triangulation of $O(m^2n)$ points that conforms to G. I will give a brief introduction on Delaunay triangulations and then proceed to talk about the proof, which uses some really basic properties of Delaunay triangulations.

References

[1] H. Edelsbrunner and T. S. Tan. An Upper Bound for Conforming Delaunay Triangulations. *In* "Proc. 8th Annual Symposium Computational Geometry, ACM, June 1992", 53-62.