

Geometry Seminar
Tuesday, Feb 23, 2010
Room 201 WWH at 6:00 P.M.

Witness Proximity graphs

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Proximity graphs are used in several areas in which a neighborliness relationship for input data sets is a useful tool in their analysis. They have also received substantial attention from the graph drawing community, being a natural way of implicitly representing graphs.

In this talk, WITNESS GRAPHS, a framework generalizing proximity graphs, will be introduced. We present witness versions of the Gabriel graph, Delaunay graph and rectangle-of-influence graph, and some efficient algorithms to compute them.

Specifically, an output-sensitive algorithm running in $O(k \log n + n \log^2 n)$ time will be given to compute the witness Delaunay graph. An optimal output sensitive algorithm running in time $O(k + n \log n)$ will be given to compute the square graph, a different generalization of the Delaunay graph.

We demonstrate some forbidden subgraphs in order to achieve a partial characterization of the new families of graphs, and give a complete characterization of the square graphs.

If time allows, we will also present some related results about stabbing disks, squares and rectangles in the plane.

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.