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Let  $P$  be a set of  $n$  points in the plane. A geometric proximity graph on  $P$  is a graph where two points are connected by a straight-line segment if they satisfy some prescribed proximity rule. We consider four classes of higher order proximity graphs, namely, the  $k$ -nearest neighbor graph, the  $k$ -relative neighborhood graph, the  $k$ -Gabriel graph and the  $k$ -Delaunay graph. For  $k = 0$  ( $k = 1$  in the case of the  $k$ -nearest neighbor graph) these graphs are plane, but for higher values of  $k$  they contain crossings. In this talk we provide lower and upper bounds on their minimum and maximum number of crossings. We give general bounds and we also study particular cases that are especially interesting from the viewpoint of applications. These cases include the 1-Delaunay graph and the  $k$ -nearest neighbor graph for small values of  $k$ . (Received April 12, 2010)