

K_8 is a Sphere-of-Influence Graph. K_9 is not.

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Let X be a finite set of at least 2 points in the Euclidean plane. The Sphere-of-Influence graph of X is defined as follows: For each point $P \in X$ let r_P be the smallest distance from P to another point in X , and C_P the circle with center P of radius r_P . The Sphere-of-Influence graph of X is the intersection graph of the set of circles of the points in X . A reasonable goal, first stated in 1989, is to determine which graphs arise as sphere-of-influence graphs of some set of points. We now know the census for complete graphs. This can also be phrased in terms of Euclidean geometry. There is a set of 8 circles in the Euclidean plane that both pairwise intersect and have no center of any circle inside any other. There is no such set of 9 circles.

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