Mathematics > Metric Geometry

On continuous expansions of configurations of points in Euclidean space

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For any two configurations of ordered points $p=(p_{1},...,\p_{N})$ and $q=(q_{1},...,q_{N})$ in Euclidean space E^d such that q is an expansion of p, there exists a continuous expansion from p to q in dimension 2d; Bezdek and Connelly used this to prove the Kneser-Poulsen conjecture for the planar case. In this paper, we show that this construction is optimal in the sense that for any $d \ge 2$ there exists configurations of $(d+1)^2$ points p and q in E^d such that q is an expansion of p but there is no continuous expansion from p to q in dimension less than 2d. The techniques used in our proof are completely elementary.

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