Reverse Nearest Neighbor Heat Maps: A Tool for Influence Exploration

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Influence Exploration

Difference to Simple Superimposition

CREST Algorithm

Experiment

Complexity and Optimality

Definition 1 (RNN Heat Map Problem)
Given two sets of points \( O \) and \( F \) and a distance metric in a two-dimensional space, the RNN set of a point \( q (q \notin F) \) is a subset of \( O \) that have \( q \) as their nearest neighbor comparing with other points in \( F \). Given any influence measure, which is a real-valued function on the RNN set, associate each point in the space with its influence value, i.e., the heat value.

The CREST algorithm solves the problem in Theorem 1 and \( \lambda \) is a lower bound. CREST is optimal for.
Case (i). \( \lambda = \Theta(\lambda^*) = O(1) \).
Case (ii). \( \lambda = n \geq \lambda^* \) and
\[
\lambda^* = \frac{n}{3} \leq \frac{n^3 + 2n}{n^3 - n^2 + 2n} = \frac{n}{3} = \lambda.
\]

Reference
