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Euclidean Distance

What is the objective of the Euclidean distance for the K-Neighbors machine learning model nearest (K-NN)?

Euclidean distance is the most widely used distance metric. The k-NN rule classifies each instance according to the majority class among the closest neighbors found in the training set using a function of distance or similarity.

When no prior knowledge is available, or even when there is prior knowledge, most implementations of k-NN use the Euclidean distance function (assuming instances are represented as input vectors). Distance functions such as Euclidean ignore any statistical regularity that exists between the attributes of the instances of the training set. The distance function can be adapted in various fields such as classification, computer vision, information retrieval, or bioinformatics, depending on the problem to be solved.

Explain the Euclidean distance equation in your own words?

The equation aims to measure the distance between two points, all this through a straight line. With reference to two variables, which will be the "x" axis and the "y" axis, the pair of objects takes the value of the number in which the aforementioned axes are. Already within the formula, which is the following: $d(A,B)=\sqrt{(x_B-x_A)^2+(y_B-y_A)^2}$ (in two dimensions) each respective variable of the corresponding axis is subtracted with that of the other objective, and to avoid negative values, it is that these are squared and then, a square root, leaving the previously squared result unchanged. In the end, the distance found between two points remains. The equation can be applied to more objects with a modification:, $d(A,B)=\sqrt{\sum_{i=1}^{N}(b_i-a_i)^2}=\sqrt{(b_1-a_1)^2+(b_2-a_2)^2+...+(b_N-a_N)^2}$ in this way, it adapts to being able to calculate infinite objectives, following the principle explained above.

References

Lifeder. (2019) Euclidean distance: concept, formula, calculation, example. May 26, 2021. Website: https://www.lifeder.com/distancia-euclidiana/

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