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Author Correction: An active learning machine technique based prediction of cardiovascular heart disease from UCI-repository database

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In the original version of this Article, in the Proposed methodology section, under the subheading ‘Learning vector quantization—cardiovascular classification’, the explanation of the algorithm ‘LVQ’ was incomplete.

As a result,

“Step 1: Start.

Step 2: Reference vector initialization based on the training vectors and denotes ‘m’ is the cluster numbers and it can be used as a weight vector. Rest of the vectors will be assigned for training mode.

Step 3: Randomly assigning the initial classification and its corresponding weights.

Step 4: Initializing K-means clustering technique.

Step 5: The reference vector β is assigned.

Step 6: Computing the square of Euclidean distance for, i and j (1-to-m and 1-to-n) respectively.

$$ED(j) = \sum_{i=1}^n \sum_{j=1}^m (\alpha_i - X_{ij})^2$$

Step 7: To compute and achieve the raising unit J where ED is locally minimum.

Step 8: Compute the initial weight of the raising unit using the relative conditions,

$$X_j^{new} = X_j^{old} + \beta(\alpha - X_j^{old})$$

$$X_j^{new} = X_j^{old} - \beta(\alpha - X_j^{old})$$

Step 9: Lessen the β learning rate.

Step 10: Initiate the stopping condition of testing.

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Step 11: Stop”

now reads:

“Algorithm 1: Learning vector quantization—cardiovascular classification

1. Clarification of parameters:
 m (number of reference vectors): This should be specified as a parameter that determines how many reference vectors (or prototype vectors) will be used in the LVQ algorithm.
 Reference Vector β : There seems to be a confusion here. In LVQ, the reference vectors are not denoted by β .
 The learning rate, often denoted by η , is the scalar that is adjusted during training.
2. Step-by-Step Clarification of LVQ Algorithm:
 Step 1: Start
 Step 2: Initialize the reference vectors (prototypes). This involves selecting m vectors from the training set to serve as the initial reference vectors for each class.
 Step 3: Randomly assign initial classifications to the reference vectors if not done explicitly.
 Step 4: Assign the initial learning rate β (often denoted by η).
 Step 5: Compute the squared Euclidean distance between each training vector and each reference vector:
 Step 6: Find the reference vector R_j that is closest to the input vector (i.e., has the minimum Euclidean distance).

$$ED(j) = \sum_{i=1}^n \sum_{j=1}^m (\alpha_i - X_{i,j})^2$$

Step 7: Update the reference vector based on the classification of the input vector:

If the input vector belongs to the same class as the reference vector R_j (denoted by $S = R_j$), update the reference vector away from the input vector:

This rule helps the reference vector better represent its class by moving towards the input vector from the same class.

If the input vector belongs to the different class than the reference vector R_j (denoted by $S \neq R_j$), update the reference vector away from the input vector:

This rule helps to increase the distinction between classes by moving the reference vector away from the input vector of a different class.

Step 8: Decrease the learning rate β according to a predefined schedule. This could be a linear decay, exponential decay, or another method.

$$X_j^{new} = X_j^{old} + \beta(\alpha - X_j^{old})$$

$$X_j^{new} = X_j^{old} - \beta(\alpha - X_j^{old})$$

Step 9: Check for stopping conditions. Common conditions include reaching a maximum number of iterations or when changes in the reference vectors become negligible.

Step 10: Stop

3. Addressing Variables and Notation:
 - Represents the components of the reference vectors.
 - Represents a training vector.
 - Represents the class label of the training vector.

R_j —Represents the j -th reference vector.

β —Represents the learning rate.”

The original Article has been corrected.



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