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Intelligent Recognition of Diabetes Disease via FCM Based Attribute Weighting

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Abstract : In this paper, an attribute weighting method called fuzzy C-means clustering based attribute weighting (FCMAW) for classification of Diabetes disease dataset has been used. The aims of this study are to reduce the variance within attributes of diabetes dataset and to improve the classification accuracy of classifier algorithm transforming from non-linear separable datasets to linearly separable datasets. Pima Indians Diabetes dataset has two classes including normal subjects (500 instances) and diabetes subjects (268 instances). Fuzzy C-means clustering is an improved version of K-means clustering method and is one of most used clustering methods in data mining and machine learning applications. In this study, as the first stage, fuzzy C-means clustering process has been used for finding the centers of attributes in Pima Indians diabetes dataset and then weighted the dataset according to the ratios of the means of attributes to centers of theirs. Secondly, after weighting process, the classifier algorithms including support vector machine (SVM) and k-NN (k- nearest neighbor) classifiers have been used for classifying weighted Pima Indians diabetes dataset. Experimental results show that the proposed attribute weighting method (FCMAW) has obtained very promising results in the classification of Pima Indians diabetes dataset.

Keywords : fuzzy C-means clustering, fuzzy C-means clustering based attribute weighting, Pima Indians diabetes, SVM
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