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Feature Weighting Comparison Based on Clustering Centers in the Detection of Diabetic Retinopathy

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Abstract : In this paper, three feature weighting methods have been used to improve the classification performance of diabetic retinopathy (DR). To classify the diabetic retinopathy, features extracted from the output of several retinal image processing algorithms, such as image-level, lesion-specific and anatomical components, have been used and fed them into the classifier algorithms. The dataset used in this study has been taken from University of California, Irvine (UCI) machine learning repository. Feature weighting methods including the fuzzy c-means clustering based feature weighting, subtractive clustering based feature weighting, and Gaussian mixture clustering based feature weighting, have been used and compered with each other in the classification of DR. After feature weighting, five different classifier algorithms comprising multi-layer perceptron (MLP), k- nearest neighbor (k-NN), decision tree, support vector machine (SVM), and Naïve Bayes have been used. The hybrid method based on combination of subtractive clustering based feature weighting and decision tree classifier has been obtained the classification accuracy of 100% in the screening of DR. These results have demonstrated that the proposed hybrid scheme is very promising in the medical data set classification.

Keywords : machine learning, data weighting, classification, data mining
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