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Medicinal plant leaf classification using gradient-based features

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Herbs are used since ancient times for healing various ailments in traditional medicine in various parts of the world. The identification or recognition of such plants has become a challenge for many, and the proposed method will help in overcoming these issues through classification of leafs using gradient-based features and Nearest Neighbour classifier in Support Vector Machines (SVM). The pre-processing steps involve binarization using Otsu's method, noise removal using median filter and resizing. After preprocessing, the preprocessed leaf image will be extracted and the gradient-based features will be analyzed using Scale Invariant Feature Transform (SIFT) where local will be based on the appearance of the object at a particular interest point, and moreover Histograms of Oriented Gradient (HOG) will be employed to focus on the structure or the shape of an object since Nearest Neighbour Classifier is used for Medicinal Plant Leaf classification in comparison with SVM-based classifiers. The proposed method is evaluated on 15 different leafs of medicinal plants consisting of 40 images per leaf. The recognition rate observed are 86.67% using SIFT and 87.78% using HOG. Testing results show that HOG descriptors significantly outperform the SIFT descriptors.

Keywords: HOG, SIFT, SVM, Medical plant leaf classification, Gradient-based features

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