

عنوان مقاله:

Identify Medicinal Plant Species Using Image Processing, Machine Learning and Feature Selection Methods

محل انتشار:

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خلاصه مقاله:

The plants are one of the most widely used resources for humans which are used in various fields so it is important to identify the plant species. Until now, it done by the expert botanists which has been difficult and time consuming. In addition, there is a lack of memory and human error. Therefore, the researchers have tried to eliminate these shortcomings by using artificial intelligence algorithms. Since the botanical studies indicate that the leaves of the tree are sufficient and necessary to identify the type of species, the desired results can be achieved only by capturing image from the leaves and then, extracting the appropriate set of features. The useful leaf features fall into three separate categories. The first category is the leaf shape features which include the leaf dimensions, the hole size or the leaf area. The second category is the textural features of the leaves, including the structure of the veins, etc., and finally, the third category contains the color features of the leaves. The different features have been tested in different articles but their effectiveness is limited to research hypotheses that are only applicable for the specific species and in perfectly ideal conditions. Therefore, in this study, it is suggested that the features of all three categories be combined and then, a method for identifying a large number of the plant species is presented. It should be noted that in this study, ۱۶ features of the leaf shape are extracted. For the texture features category, ۱۱ features are calculated and also for the leaf color category, ۴ features are extracted. Next, these ۳۱ features are evaluated by the relieff and Fisher Score feature selection algorithms and then the optimal features subset is selected for the classification step. Finally, the features vectors are formed and we classify them using the K-Nearest Neighbor algorithm. The conclusion of the work is the comparison of the obtained results from the proposed methods with the results of similar works, which is evidence of the better performance of the proposed method.

کلمات کلیدی:

.Leaf Recognition, K-Nearest Neighbor (KNN), Feature Extraction, Feature Selection, Image Processing, Medicinal Plant :

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