Plant Diseases Recognition for Smart Farming Using Model-based Statistical Features

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The current focus of our research is to detect and classify the plant disease in agricultural domain, by implementing image processing techniques. We aim to propose an innovative set of statistical texture features for classification of plant diseases images of leaves. The input images are taken by various mobile cameras. The Scale-invariant feature transform (SIFT) features used as texture feature and it is invariant to scaling, rotation, noise and illumination. But the exact mathematical model of SIFT texture descriptor is too complex and take high computing time in training and classification. The model-based statistical features are calculated from SIFT descriptor to represent the features of an image in a small number of dimensions. We derive texture information probability density function called Generalized Pareto Distributions from SIFT texture feature. The main focus of our proposed feature is to reduce computational cost of mobile devices. In our experiment, 10-Fold cross validation with SVM classifiers are applied to show that our experiment has no data bias and exclude theoretically derived values.