Detection and Classification of Diseased Tomato Leaf Using Image Processing Techniques

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Tomato plants are highly vulnerable to fusarium wilt, verticillium wilt, and late blight. The symptom is yellowing of the lower leaves, which gradually wilt and die. The naked eye observation of experts is the main approach adopted for detection and the identification of plant diseases. We developed a method to detect and classify damages in leaves using image processing techniques. For this experiment, images downloaded from the interne were used. The disease regions were segmented using K-Means clustering and the classification of the disease was done with Support Vector Machine (SVM) by training with the selected features from the training set of images. The initial version has three classes such as Bacterial Wilt, Early blight and Healthy tomato leaves. The accuracy level for the identification and the classification of diseases was calculated for each category separately. The accuracy of the system for the selected nine features was calculated as 76.5%. Association among the features as Contrast, Correlation, Energy, Homogeneity, Entropy, Mean, Standard deviation, Skew, and Kurtosis gave the optimum accuracy. This system with high accuracy motivates the other researchers to extend the system with added functionality, which will be a farmer friendly software solution.

Keywords: HSI, K means, Gray level co occurrence matrix, Support Vector Machine (SVM),