

An Automated System for the Detection of Citrus Greening Disease Based on Visual Descriptors

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Abstract : Citrus greening is a bacterial disease that causes considerable damage to citrus fruits worldwide. Efficient method for this disease detection must be carried out to minimize the production loss. This paper presents a pattern recognition system that comprises three stages for the detection of citrus greening from Orange leaves: segmentation, feature extraction and classification. Image segmentation is accomplished by adaptive thresholding. The feature extraction stage comprises of three visual descriptors i.e. shape, color and texture. From shape feature we have used asymmetry index, from color feature we have used histogram of Cb component from YCbCr domain and from texture feature we have used local binary pattern. Classification was done using support vector machines and k nearest neighbors. The best performances of the system is Accuracy = 88.02% and AUROC = 90.1% was achieved by automatic segmented images. Our experiments validate that: (1). Segmentation is an imperative preprocessing step for computer assisted diagnosis of citrus greening, and (2). The combination of shape, color and texture features form a complementary set towards the identification of citrus greening disease.

Keywords : citrus greening, pattern recognition, feature extraction, classification

Conference Title : ICIPCVPR 2018 : International Conference on Image Processing, Computer Vision and Pattern Recognition

Conference Location : Sydney, Australia

Conference Dates : December 03-04, 2018