Model-based Statistical Features for Mobile Phone Image of Tomato Plant Disease Classification

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We introduce a set of statistical features and propose the SIFT texture feature's descriptor model on statistical image processing. The proposed feature is applied to plant disease classification with PlantVillage image dataset. The input is plant leaf image taken by phone camera whereas the output is the plant disease name. The input image is preprocessed to remove background. The SIFT features are extracted from the preprocessed image. As a main contribution, the extracted SIFT features are model by Generalized Extreme Value (GEV) Distribution to represent an image information in a small number of dimensions. We focus on the statistical feature and model-based texture features to minimize the computational time and complexity of phone image processing. The propose features aim to be significantly reduced in computational time for plant disease recognition for mobile phone. The experimental result shows that the proposed features can compare with other previous statistical features and can also distinguish between six tomato diseases, including Leaf Mold, Septoria Leaf Spot, Two Spotted Spider Mite, Late Blight, Bacterial Spot and Target Spot.