MACHINE VISION BASED CLASSIFICATION OF TOBACCO LEAVES FOR AUTOMATIC HARVESTING

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ABSTRACT—A machine vision based approach for classification of tobacco leaves for automatic harvesting in a complex agricultural environment is proposed in this paper. The CIELAB color space model is used to segment the leaf from the background. The segmented leaves are classified into three classes viz., ripe, unripe, and over-ripe. Models based on various textural features such as GLTP (Gray Level Local Texture Patterns), LBP (Local Binary Pattern) and LBPV (Local Binary Pattern Variance) are studied in this work. The K-Nearest Neighbor (K-NN) classifier based on the Euclidean distance measure has been used for classification. Experiment is conducted on our own dataset consisting of 244 images of tobacco leaves captured in both sunny and cloudy lighting conditions in a real tobacco field. The experimental results show that GLTP model achieves significant improvement in classification accuracy over traditional LBP and LBPV.

Key Words: Tobacco leaves, Classification, CIELAB color space model, Gray level local texture pattern, K-NN Classifier.