ABSTRACT

Smart Farming 4.0 is a technology-based intelligent farming method. In addition, Indonesia is one of the largest producer and consumer countries in Asia. But at the time of cultivation of tea plants there are obstacles such as pests and diseases that affect the yield of tea crop production. Therefore, the system that diagnoses pest-affected tea leaves is expected to have the system to diagnose the tea leaf pest more accurately for Smart Farming 4.0 and increase plantation yield.

This study identified pests on tea leaves using digital image processing. The first stage starts from image acquisition, preprocessing, then the image in feature extraction using, Contourlet Tranforms. Extraction of Contourlet Tranforms using the Pyramidal Directional Filter Bank. The results of the Contourlet coefficient are taken as statistical characteristics of each image of the results data from stored training images into a database. The training image data will be a reference used for identification of pest types using Support Vector Machine.

The research identifies 5 types of tea leaf image pests that are Thrips, Helopeltis, Redmite, Empoasca and Caterpillar on each block. The study uses 100 training data and 25 test data. The extraction feature by using 5 statistical features i.e. Skewness, Mean, Entropy, standard deviation, Kurtosis. Another Parameter is the Median Filter 2×2 and use a polynomial kernel. In this research produced output, the system can identify pests on the image of tea leaves with an accuracy of up to 84 for test data and computational time 84 seconds.

Keywords: Image Processing, pests, contourlet transform, support vector machine (SVM).