ABSTRACT

The problem of flaw in tea leaves Camellia sinensis is an important problem in tea plantation in Indonesia. The existence of flaw in the tea leaves causes a significant decreasing in production. During this time, the evaluation of tea leaves conditions for granting the pesticides is done manually through visual observation. Evaluation in this way would require a long time if it is associated with the extent of the tea plantation which should be evaluated.

Through this final project, the author tries to provide solutions to the above problem by designing a system that can detect normal leaves condition without flaw and tea leaves with flaw : blister flaw, flaw due to mite pests and defection because of pest thrips. The system is designed by two methods. The first method using Principal Component Analysis (PCA) as feature extraction method and ANN Learning Vector Quantization (LVQ) as a method of classification while the second method uses color analysis method and comparison of leaves length and width as a feature extraction method. Parameter values obtained from feature extraction are inserted into the PCA and classified by using LVQ ANN. At the end of the discussion, the two methods above are used to classify only two classes namely normal leaves without disabilities and disability leaves due to pests.

In this final project, system testing is done using 100 trained images and 160 test images. The best simulated parameter is PC (Principal Component) 1-55, 200 epoch, learning rate is 0.0075, and 16 hidden layer. The results of the accuracy of those parameters obtain when using second methods (PCA and color analysis) is 78.46% for the classification of four classes and 85.38% for the classification of two classes with the computing time 4.477 seconds.

Keywords : Camellia sinensis tea leaves, PCA, color analysis, LVQ ANN