ABSTRACT

Indonesia is the 3rd largest country producer and exporter of cocoa in the world after Côte d'Ivoire and Ghana. The quality of cocoa beans are influenced from the fruit itself. One of the parameters of the quality of cocoa pods presence or absence of disease generated by pests or pathogens that attack cocoa plants. But checking the disease in cocoa still done manually by humans with accuracy level is still relatively low.

In order for the process of checking the disease in cocoa can be more efficient, we need a system that can automatically identify the disease. In this final task the author will design a system to identification of diseases of cocoa based automatic digital image processing. The workings of this system is to compare samples of cacao to be examined with reference to the existing database. In this study only identifies normal fruit and the type of black pod disease and helopeltis. The design of the system in this final task is using Principal Component Analysis (PCA) methode, K-Nearest Neighbor (KNN) classification and implemented using Matlab R2009a applications.

Based on the whole test result, it can be concluded that the system can identify the type of disease in cocoa. Results of the highest accuracy is 86.67% was obtained with a combination of three parameters that is, using the normalization image 128 x 64 pixels, without limiting the number of PCs that are used and the method of distance Cityblock where the value of k = 1. The average computation time needed for the pre-processing is 0.31284 seconds, while the average computation time required for the process of feature extraction is 0.03598 seconds and the average time required for classification process is 0.07774 seconds.

Keywords: *Cocoa fruit, Cocoa Disease Identification type, PCA, k-NN, MATLAB.*