

ABSTRACT

Indonesia is one of many tropical countries in this world, have a lot of nature resources makes Indonesia admitted as one of richest country, for example is the forest resource whether it is natural forest or planted forest with various ecosystem including trees. Wood is one of some things that produced by tree which can be processed to be wooded material product such as chair, table, cupboard and so on. Lately, Indonesia stands on 13th position as the biggest wood exporter country in the world, below China, Malaysia and Vietnam. The wood itself has to be well qualified before it is exported. The main issue of why Indonesia stand below Malaysia and Vietnam is because here in Indonesia still using manual way to sort the wood which is ineffective.

To make the sorting process more effective and still get the well qualified wood, we need the system that able to detect the defects on the wood and sorting it automatically. In this final project, the writer will build the system which is able to classify the defected woods based on the existing of the defects itself. This system using first and second order statistical feature extraction method, for the classification method this system using k-Nearest Neighbor also known as k-NN. Beside those two methods, this system also using image morphology method as a comparison. This system was built in Matlab R2013a software.

Based on the simulation result, it can be concluded that this system can differ the wood condition whether it is damaged or not. This system obtained the highest accuracy when using k value on k-NN = 1 in euclidian distance and it was 79,3233% of accuracy. Also in image morphology method, the best accuracy this system could get is 95,1128%.

Keywords: *Matlab, wood, texture analysis, statistics, k-NN*