ABSTRACT

As a fulfillment of household appliance needs, cedarwood is a popular material. Aside from its distinctive aroma, quality is the main point that needs attention. The quality of this wood can support one based on fiber patterns. In general, the wood processing industry does a manual classification process by relying on the sense of sight. As a result accurate and time efficiency also varies. Reliable credibility of the local wood industry. Machine learning is the solution to that problem. Several studies have been carried out, one of which uses the HOG feature and SVM classification with an accuracy of 90% and a time of 1.40 seconds [1]. However, in the industrial era 4.0 which incidentally is very concerned about technological updates, it is necessary to upgrade a system that has high performance in implementing production efficiency.

In this final project, a cedar wood classification system will be designed by applying one of the deep learning methods, namely the Convolutional Neural Network. The data set used consisted of five classes with dimensions of 18.3 cm x 6.2 cm x 0.45 cm for classes A, B, and D and 18.3 cm x 7.6 cm x 0.45 cm for class C and E. Feature extraction is carried out at the convolution, activated and pooling layers. Total layers used are 16 heavy layers with input consisting of images taken automatically using the Logitech Brio 4K integrated with Arduino Uno and ultrasonic sensors

The results of this final project research showed a significant improvement in the quality assessment system with a maximum approval of 97% and an average prediction speed of 0.56 seconds per class.

Keywords: *cedarwood, image digitization, convolutional neural networks, serial communication.*