

ABSTRACT

Indonesia is a country that is very rich in tree species that grow in the forest. Timber growth in Indonesia consists of \pm 4000 types where each type of wood has different names and characteristics. From these differences can be seen the quality and proper use of each type of wood. The procedure of standard identification is still carried out through visual observation by wood anatomy. The process of identifying this wood greatly requires the availability of wood anatomists, with the limited number of anatomists to influence the results and the length of time to identify.

This final project uses an identification system that can classify wood based on species names with macroscopic images of wood and implementation of Convolutional Neural Network (CNN) methods as classification algorithms. The macroscopic image of wood is taken from a smartphone with a digital magnification of 3.5 times and the aid of digital-loupe 60 times magnification results in a total optical magnification close to 210 times. The total image of wood used is 5535 which is divided into 30 species.

The supporting architecture used is AlexNet, ResNet and GoogleLet. The architecture is then compared with a simple CNN architecture namely Kayu30Net. Kayu30Net architecture has precision performance values of 84.6%, 83.9% recall, F1 score 83.1% and accuracy of 71.6%. In the wood species classification system using CNN, the AlexNet architecture is the best architecture that refers to precision values of 98.4%, recall 98.4%, F1 score 98.3% and accuracy of 96.7%.

Keywords: Wood Classification, Convolutional Neural Network, AlexNet, ResNet, GoogLeNet, Kayu30Net