

ABSTRACT

Indonesia has a tea research center (*Camellia sinensis*) One of the largest in southeast Asia, namely the Tea and Quinine Research Center (PPTK) Gambung, Bandung regency. One of the productions of PPTK Gambung is Gambung tea with Assamica type which is given the name Gambung tea clone 1-11 or GMB 1-11. GMB 1, 3, 4, 7, and 9 type of tea clones are the favorite products of the Gambung Tea series. To distinguish between its types is still quite difficult to do by the general public because of the same form and color and only a few researchers in the PPTK Gambung can distinguish.

In previous studies, the classification of Gambung tea leaves became the top 5 categories (GMB 1, 3, 4, 7, 9) and the level of accuracy gained 90%. This research will be conducted classification on the Tea leaf GMB 1-11 series using a method that is a Convolutional Neural Network (CNN) based deep learning using the Python programming language. The used architecture was Alexnet. Alexnet was CNN's architecture that won the ILSVRC competition in 2010 by obtaining the lowest error rate of 17.00% and in 2012 again winning the competition with the lowest error rate of 15.3%.

In this research, there are three scenarios where the best scenario will be obtained. Data used as much as 3300 data consisting of 1100 original data and 2200 data augmentation. The best scenario gained is by using Adam's optimizer, learning rate 0.001, and epoch 100. The result of the best scenario in the study, the system can classify the Tea Leaf GMB 1-11 series with the level of accuracy obtained at 98.18%, loss 1.82%, and the precision of 98.31%.

Keywords: Gambung Tea Series, Convolutional Neural Network (CNN), Alexnet