

ABSTRACT

Oil palm is a crucial ingredient in cooking oil production and is also used in producing soaps, candles, cosmetics, inks, and toothpaste. Oil palm is produced from ripe palm fruit. Palm fruit maturity is determined by its shape and colour, which an experienced person can determine. A palm maturity detection system was designed using the Convolutional Neural Network (CNN) method to avoid reliance on a person and accelerate the maturation detection process. CNN is one of the breakthroughs in sorting and determining whether palm fruit is ready for harvest or not ready in a computed production system.

This final project makes use of images dataset from palm fruit consisting of 3 classes, raw, ripe, and rotten classes, with each class containing 100 images so that there are 300 images. The dataset is used as training, validation, and test data with a percentage distribution of 65% of training data, 20% of validation data, and 15% of test data. This study used CNN's MobileNet architecture. The MobileNet architecture is used because it is low complexity, and this architecture is simple.

In this Final Project, testing is carried out using six scenarios to get the best scenario. The best scenario obtained in this study used 224×224-pixel images, RMSprop optimizer, learning rate 0.0001, epoch 50, and batch 16. From the best scenario, the best performance results were obtained, namely 100% training data accuracy with a loss of 0.0349, 100% test data accuracy with a loss of 0.0569, and a precision value of 100%, recall 100%, and f1-score 100%.

Keywords : Oil Palm, Convolutional Neural Network, MobileNet