ABSTRACT

Indonesia is one of the leading producers and exporters of palm oil. Palm oil is commonly utilized for cooking oil, industrial applications, and fuel. The ripeness of palm oil fruit plays a crucial role in determining the quantity and quality of the oil produced. With advancements in technology, this study employs the Convolutional Neural Network (CNN) method to classify the ripeness of Fresh Fruit Bunches (FFB) based on color. The ripeness of palm oil fruit is classified into four categories: unripe, under-ripe, ripe, and overripe. The dataset used in this research consists of 5000 palm oil images. The images then undergo pre-processing and normalization. The data was then trained with 6 experimental scenarios with varying parameters such as the number of epochs, batch size, convolutional layers, learning rate, and dropout rate. The best results were obtained in the last scenario with 200 epochs, batch size 64, 5 convolutional layers, a learning rate of 0.0002, and a dropout rate of 0.7. The research demonstrates that the CNN model achieves an accuracy of 99.31% during training and 92% during testing, although challenges remain in distinguishing images with similar features.

***Keywords** : palm oil, fruit ripeness, Convolutional Neural Network*