ABSTRACT

DIGITAL IMAGE PROCESSING TO IDENTIFY THE LEVEL OF MATURITY OF PALM FRUIT BASED ON RGB AND HSV COLOR USING THE METHOD OF SELF ORGANIZING MAP (SOM)

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Palm oil is one of the largest export commodities in Indonesia. Accuracy in determining the level of maturity of oil palm fruit determines the quality of this plant's harvest. This research uses digital image processing to identify the maturity level of oil palm fruit based on RGB (Red, Green, Blue) and HSV (Hue, Saturation, Value) colors. Images in the form of photos of oil palm fruit taken with a digital camera were processed with MATLAB software and then analyzed using the Self Organizing Map (SOM) method to obtain a comparison of the RGB and HSV feature extraction results. The results of the research succeeded in distinguishing the level of maturity, namely very ripe, ripe, almost ripe and unripe, the color of the oil palm fruit was red, black orange, yellow and black. The accuracy of the results using the performance evaluation matrix method of the SOM method, namely Quantization Error, Silhouette Score and Topographic Error. Quantization Error RGB (0.004737) is lower than HSV (0.073178) which shows RGB's ability is good in representing data in SOM, Silhouette Score HSV (0.704204) is higher than RGB (0.599846) indicating HSV's ability is slightly better in grouping objects and both have no problems on Topographic Error mapping (0.000000). In the RGB image similarity approach, it is better than HSV.

Keywords: Identification of Maturity, Palm Oil, RGB, HSV, Self Organizing Map
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