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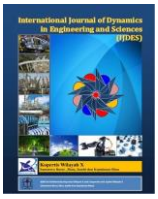

IDENTIFICATION OF MANGO FRUIT MATURITY LEVEL BASED ON SHAPE ANALYSIS USING K-MEANS CLUSTERING

Itin Riati[1] , Tesa Vausia Sandiva [2] , Agung Ramadhanu [3]
[123]University Putra Indonesia "YPTK" Padang
*Correspondence should be addressed to itinriyantibts@gmail.com
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Abstract

Mango fruit is a seasonal fruit, for farmers mango fruit is one of the export commodities for farmers' lives because mango farming can improve their welfare, but there are still many people who have difficulty determining the level of ripeness of mango fruit that is good and good for consumption, given the Identifying this level of ripeness can help farmers separate mangoes that are suitable for consumption, so that people can easily choose, researchers use the k-means clustering method with mango fruit objects based on color, the input image will be processed using an RGB image, then a detection process will be carried out. and converted to a binary image.

Keywords: Identification of,Mangoes,Based on the Form of,K-Means Clustering

1. Introduction

Mango is very much in demand among Indonesian people because mango is a fruit that has many benefits, especially for health. Especially in digestion because of the content of amylase compounds and dietary fiber which prevent constipation. There are many more health benefits of mangoes. At this time mangoes are important for the lives of farmers because the business of mango farmers can increase their welfare. [1]. For people who have very little knowledge, it is quite difficult to know the level of maturity of a good mango so that it is good for consumption. If the level of maturity is not good, it will become a disease because even though it looks good, it turns out that many of them are not ripe properly [2]. Based on the problems above, it is necessary to identify the maturity level of mangoes based on shape using K-Means Clustering. This research can be an alternative technology that can help overcome existing problems[3]. This can later be applied when processing shape images in identifying mangoes to identify objects. Digital images of mangoes require assistance in the field of science, namely K-Means Clustering. K-Means Clustering is one of the most popularly used machine learning algorithms, especially unsupervised learning[4]. This research is expected to help in the field of agriculture and also in plantations, especially in determining the level of maturity of mangoes that are good and in accordance with[5].

2. Research of Methodology

This section explains the research steps that are being designed including how to obtain data, how to process data, how to analyze data and how to test data. Mango is one type of fruit that has many sources of vitamins and minerals in Indonesia, besides being consumed as fresh fruit, mangoes can also be processed into various kinds of food and drinks, such as juices, salads, puddings and so on[6].

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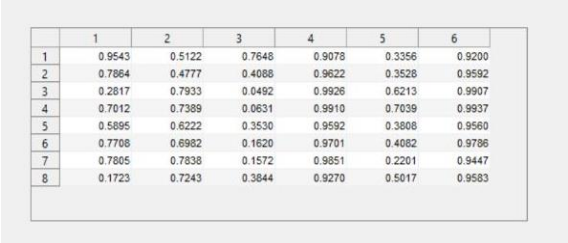

	1	2	3	4	5	6
1	0.9543	0.5122	0.7648	0.9078	0.3356	0.9200
2	0.7864	0.4777	0.4088	0.9622	0.3528	0.9592
3	0.2817	0.7933	0.0492	0.9926	0.6213	0.9907
4	0.7012	0.7389	0.0631	0.9910	0.7039	0.9937
5	0.5895	0.6222	0.3530	0.9592	0.3808	0.9560
6	0.7708	0.6982	0.1620	0.9701	0.4082	0.9786
7	0.7805	0.7838	0.1572	0.9851	0.2201	0.9447
8	0.1723	0.7243	0.3844	0.9270	0.5017	0.9583

Figure 1. Counting of Color and Value Table

Color	R	G	B
Green	255	0	0
Red	0	255	0
Blue	0	0	255
Black	0	0	0
White	255	255	255

Table 1. Color and Value Table

Binary images are images that have only two grayscale values, black and white, although color images are now preferred. Binary images are still needed for several applications, such as image processing to identify mango varieties. [8] As discussed in this study, midwife images have two shades of gray, black and white. [9]

Figure 2. Binary Image

3. RESULT

K-means clustering is a method that belongs to non-hierarchical clustering where each object included in a group is the same object and collaborates. Data that is grouped together has a greater degree of similarity and has a greater degree of difference with other groups. Basically clustering is a method for categorizing or grouping a group of objects. Clustering is a method in data mining where the work process in this algorithm is directionless (persive elements). meaning that this method no longer requires training and without a teacher, output is not even needed.

In this study, images of mangoes that had a level of complexity were selected to test the accuracy of the K-Means method. The K-Means method takes several stages in the text classification process, namely the stage of making a specific transformation texture, and the stage of classification. The classification process of sweet fragrant mango using the feature extraction results of the testing data results of the training classification process, the result of this process is the Image index value of the largest decision function which states the class of the test data, the class resulting from the test classification process is the same as the test data class. then the image recognition using the K-Means Clustering method is declared correct.

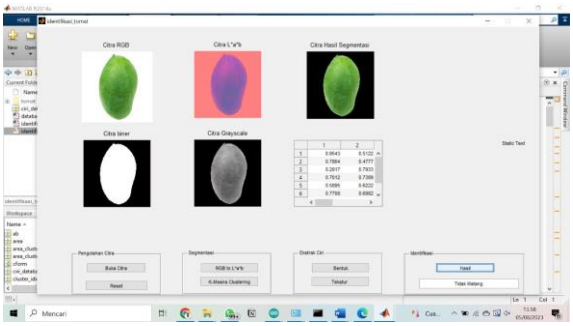

Figure 3. Data Of Progress

4. CONCLUSION

The results of research on classification of mangoes using the cluster image processing method can be concluded where segmentation expands and shrinks from component labeling to feature extraction used which is believed to be able to classify maturity levels appropriately .

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