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DETECTION OF SOMEONE'S CHARACTER BASED ON FACESHAPE USING THE CANNY METHOD

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Abstract

Character is a unique way of interacting by individuals in creating a relationship. When interacting with people, it requires us to be face to face. The face is a very important element in communicating because from the face we can see a person's expression and the person's facial pattern so that their character can be known. The face is considered a reflection of a person's character so that a science called physiognomy has emerged. Physiognomy science is usually only known by experts, to get an easier way, technology can help provide solutions. The solution is to use a camera by taking a picture of the face whose character you want to understand, then doing a digital image processing (PCD). In this PCD process, there are several processes for processing images in order to obtain information from the image. One way is to use canny edge detection. Canny edge detection is used to identify or recognize object boundary lines in the image after the canny edge detection process is completed. The next process is to recognize face patterns by adding the euclidean distance method so that the face shape pattern can be recognized. The results of facial recognition test using the Canny and Euclidean distance method from 40 facial images, the percentage of success is 80%.

Keywords: Physiognomy, edge detection, canny, Euclidean Distance

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1. INTRODUCTION

Character is an important part of creating a relationship. Character is a unique way of interacting by individuals to social stimuli and the quality of themselves carried out on the social aspect of their environment [1]. When interacting or relating to other people, we need face to face or face to face because faces are a very important element in communication. The face is considered as a reflection of a person's character. Experts have long studied the relationship between faces and characters, so a science called physiognomy has emerged. By observing the part of the face, a person's personality traits can be learned.

Jones uses physiognomy in the process of selecting a jury trial, because this knowledge can be used to develop personality, improve a relationship to career development, and can also be used for work placements [2]. Robert Whiteside also conducted a study, the results of this study revealed the match between personality, relationship and career which has a match rate of 92% [3]. So this research is important because it has many benefits for everyday life, for example, is to help HRD employees of a company to select new employee admissions, helping teachers to recognize the character of their students so they can apply proper learning methods for their students, to analyze various characteristics. and the nature of the other people we talk to so that we don't offend them while talking, and so on. The problem that occurs is that not everyone has the ability to read human characters through the face.

To get an easier way, technology can help provide solutions to these problems. To find out a person's character based on face shape, you can use a camera by taking a picture of the face you want to know the character of and then doing the digital image processing. There are several ways to process images in order to get information from the image, so that it can be used. One of them is edge detection to get the edge of a desired image. One method to detect the edge is canny.

The canny method is used to identify or recognize object boundaries in the image. The canny method is a true edge detector with a minimum error rate. In other words, the Canny method is designed to produce an optimal edge image [4]. The Canny method uses a gaussian derivative kernel to filter noise from the initial image to obtain smooth edge detection results. Furthermore, to determine accuracy in detecting face shape, the euclidean distance method is selected. Euclidean distance calculates the root of the square of the difference between two vectors. The smaller the euclidean distance between two images, the more similar the two images will be. So that it is expected to digitally recognize a person's face shape and character.

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2. METHODS

A. Time and Place of Research

The research was carried out from January 7, 2019 to January 10, 2019. The research was conducted at Balitar Islamic University, which is located at Jl. Majapahit No.2 - 4, Sananwetan, Blitar city and neighbors around the house which is located in Sumberjo village, Kademangan sub-district, Blitar district.

B. Data Collection Method

The method used to collect information is carried out in the following stages:

1. Observation

The method used to obtain data is by observing the object of research and systematically recording an idea under investigation. The activity carried out is collecting facial image data to be used as a reference image. The data that the researchers managed to collect during the observation process were facial image files from 40 people.

2. Literature study

Search from various sources about a person's character based on face shape, digital image processing, canny edge detection methods, and MATLAB programming sourced from books, journals, research reports, and various other sources.

C. System Design Methods

1. Flowcart of Face Shape Recognition

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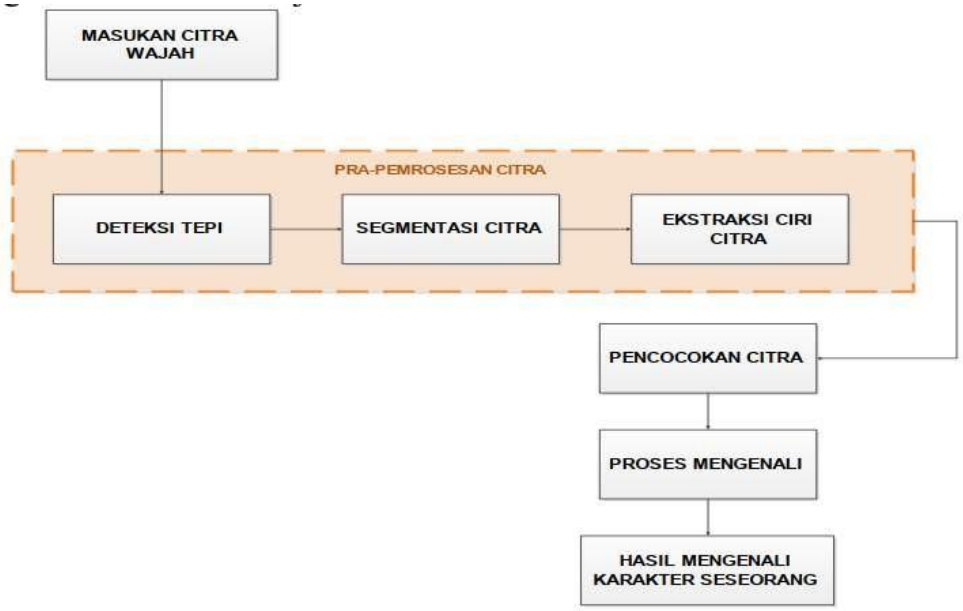

Figure 1. Diagram For Identification Of Face Shapes

The explanation of the System Flowchart in Figure 1 is that the pre-processing stage will simplify the image so that the image is ready for analysis. The pre-processing process is divided into 3 processes, the first is edge detection using the Canny method which includes grayscaling, image smoothing, gradient finding, non-maximum suppression, double thresholding and edge tracking by hysteresis. The next stage is image segmentation, which is the stage of the segmentation process which aims to remove areas that are not part of the face. To get pixel coordinates, this process uses closing operations, filing holes and erode. The next step, the segmentation results will be extracted the characteristic shape with the eccentricity parameter. Furthermore, facial recognition using image matching is carried out to look for similar or similar images, then proceed to the recognition stage. Before entering the image matching process, the input image input that will be used as a comparison must be in the form of an image that has been segmented and extracted its shape features. The next step is to calculate the euclidean distance, the smaller the euclidean distance between the two images, the more similar the two images will be. Furthermore, the introduction stage can be carried out. In the face shape recognition process, extraction of the parts contained in face shape recognition is carried out. After the face is recognized by its shape, the application will extract the face shape so that a person's character can be recognized

2. Canny

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Flowcart Method

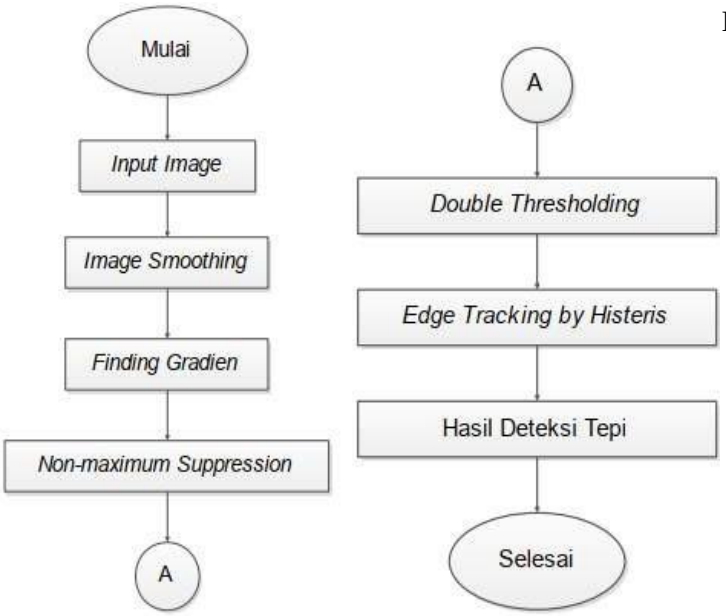

Figure 2. Diagram Of Canny Method

Explanation of the Canny Method Flowchart in Figure 2 is a canny edge detection method where image smoothing is performed to remove noise using Equation (1). Then doing the process of finding a gradient to get edge strength using Equations (2), (3), and (4). The next step is to streamline edge detection or non-maximum suppression, then create binary images using double thresholding and edge trancking by hysteresis. Edge detection using the Canny method is one of the developments of the edge detection technique with the ability to reduce noise by calculating edges so that more edges are produced.

3. RESULTS AND DISCUSSION

In the application, the detection of a person's character based on face shape uses the Canny method. Users are required to input an image in the form of a face that will recognize the character, as shown in Figure 3.

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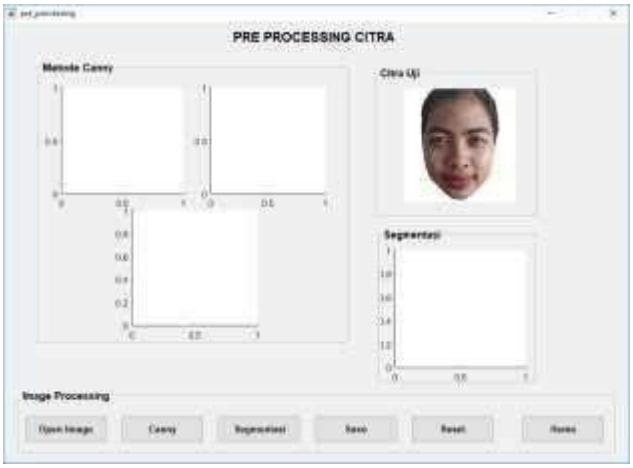

Figure 3. Face Image Input View

After the user input the face image by pressing the open image button. Then press the canny button to process it, then press the segmentation button to produce a face shape as shown in Figure 4. The segmentation results can be saved by pressing the save button, the segmentation results will be used to detect someone's character on the pattern recognition menu.

Figure 4. Results of Canny Edge Detection And Segmentation

To recognize face shapes and their characters, it is done in the pattern recognition menu. To use this menu, the user is required to input an image in the form of a segmentation image that will recognize its character, as shown in Figure 5.

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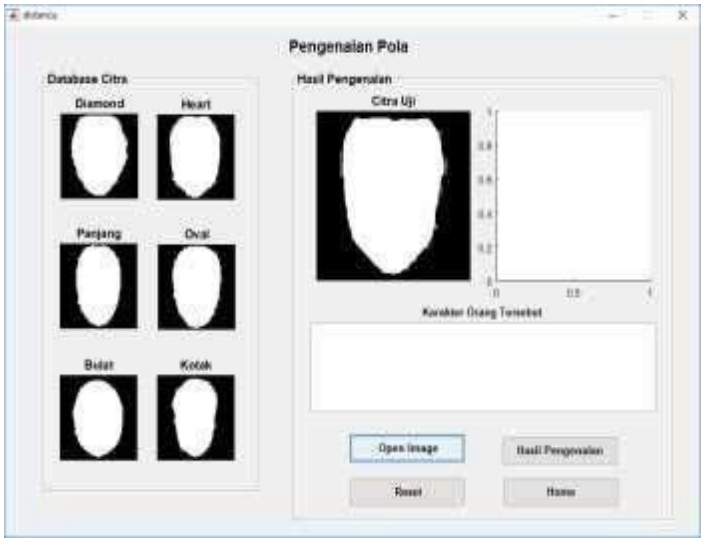

Figure 6. Introduction Results

The test results will be tested, to compare the input face image to the face shape, there are 40 images in this experiment. Tests are carried out to determine the accuracy of the program output, and to calculate the percentage of success of the applications that have been built. The system test results after the system is finished are submitted to the make-up. He was asked to be a makeup expert because the one who studied the science of facial shapes was a makeup expert. And the testing has been carried out at the Vivi salon, which is addressed in Maron village, Kademangan sub-district, Blitar district. For the sample trial results are presented in Table 1.

No	Kode	Face Shape	Character
1	K1	Diamond	Personal who are warm and high-willed, love to be in control, detail-oriented so that their work is quality, and are able to manage words and communicate well, but they tend to be selfish, like to tell about their sacrifices, and they also like to neglect words sharp.

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2	K2	Heart	They have extraordinary personal strength but are sometimes stubborn because their mindset is strong. Strong and agile, not because of their stamina but their own strength. So, if they have a goal, they will do whatever it takes to achieve it. A good self analyzer, this is supported by the ability to think quickly and an excellent memory. On the other hand, very ambitious, independent, but not easy to get along with.
3	K3	Long	Have good logic, mindset, and planner. Creative, practical but not open about his feelings. People who have this face shape, have a straight or athletic body. Therefore, the impression is healthy, fit, and active.
4	K4	Oval	Always know the right things to talk about, so they can make someone feel welcome and comfortable. However, sometimes they are too focused on just saying the right things.
5	K5	Round	Mental kuat dan percaya diri, cerdas, mampu beradaptasi pada semua kondisi, dermawan, rendah hati, dan selalu mendahulukan orang lain, tapi cenderung malas dan dalam percintaan tidak setia.
6	K6	Square	Love to be physically active and work on big projectsbecause he has great stamina. Practical, aggressive, and rebellious. He can be very materialistic, aloof, and highly empathetic.

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TABLE 2. DATA TESTING SAMPLE

No	Natural Pict	Edge detection	Segmentation result	Facesh ape	Test result
1.				Heart	Right (K2)
2				Round	Right(K 5)
3				Square	Right (K6)
4				Oval	Right(K 4)
5				Diamond	Right(K 1)

Based on the result done in the system of 40 face, the percentage is 80%.

$$Precentage = \frac{32}{40} \times 100\% = 80\%$$

4. CONCLUSION

Based on the application made along with the trials that have been carried out, it can be concluded that in face shape recognition using canny edge detection, the results obtained are not optimal where long and oval face patterns often have similarities. So that with the addition of the euclidean distance method on the face it will be recognized better. This is proven by the results of the facial image test data from 40 people, the percentage of success is 80%.

In face pattern recognition, not all facial images are recognized by facial patterns. Of the 40 facial images, 20 are recognized as diamonds, 8 hearts, 10 ovals, 1 round and 1 square. From the results of the percentage of success, this application can be used to recognize facial shapes and their characters. The results of this character recognition are limited to predictions, therefore it is better not to trust the results of these predictions too much.

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In the development of a person's character detection application based on face shape using the Canny method to get maximum results, researchers can then use other edge detection methods such as Robert, Sobel, Prewit, Laplacian and for pattern recognition it can be replaced by using the Canberra distance or Mahalanobis distance method. In the testing process, in order to get MSE, an artificial neural network can be added so that later it will get more accurate results.

Character recognition is not only for the face shape, but also the shape of the eyes, nose, lips, and eyebrows. It is hoped that the next researchers can conduct further research to identify these characters.

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