



Representation of Image Recognition For Attendance Validity Online

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ARTICLE INFO

Article history:

Received: 24/22/2020

Revised: 01/28/2020

Accepted: 01/02/2020

Keywords:

Image Recognition, Matching Template, Online Attendance.

ABSTRACT

Image is a 2-dimensional intensity function $f(x, y)$, where x and y are the spatial coordinates and f at the point (x, y) is the brightness of an image at a point. An image obtained from the capture of light reflected by the strength of the object. Output image as a recording apparatus, such as cameras, digital games can be analog, Figure itself was composed of pixels that can be taken into account. Thus the images suitable for use as a sample in this study. In this case the process of designing and manufacturing of online attendance system that is able to detect the validity of a student. The system uses the template matching method is used as a student face detection. Matching Template Method is a technique in digital image processing to find small parts of the image that matches the image of existing templates. The application will test the input image is detected or not. The results showed that the inputted face image detected correctly. Therefore, the study concluded that Matching template method is suitable for use in the attendance system.

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1. Introduction

Attendance system is how the process of recording an attendance carried out, while attendance is a document that records hours of attendance per worker or student. Fairly rapid technological developments today can be felt in the attendance system, where attendance is now widely utilize technologies such as fingerprint based attendance has started bustling used both in companies, offices, and in the scope of the school.

Image recognition technology is not something that is foreign to the present era. The same image detection as well as fingerprint matching technology and voice recognition are performed to distinguish between a person's physical condition with one another. All these systems take data from an unknown person, analyzing the data in the input, after which it matched with existing entries in the database. When an image successfully uploaded, the software in the computer will analyze it to identify where the image is located. Once the image has been identified, the system will process the image recognition closer to images and then put in the form imageprint. Imageprint sendiri is a characteristic that is used to uniquely identify an image. Some of the criteria is the reason why use it.

Template matching it self is a technique in digital image processing to find small parts of the image that matches the template image. Template matching is one of the ideas used to explain how our brains recognize return forms or patterns. Templates in the context of pattern recognition refers to the internal construct that if the match (match) with sensing stimuli lead to the recognition of an object.

The main objective of this research to create a web-based student attendance system, is expected to provide direct benefits to those in need. Help the lecturer to obtain a valid student attendance data. As known absent cesa requirement that must be met in carrying out a lecture. So it takes valid data to avoid the practice of illegal absences.





2. Literature review

The first journal under the title "Student Attendance System Facial Image Based Method Using Principal Component Analysis (PCA)". In this study reviewed these face detection to face attendance, where attendance is also a very important attendance record in education. Including at the Islamic University of Majapahit, absenteeism contributes considerable value in the study contract. Therefore it is very necessary attendance data authenticity. Use Method *Principal Component Analysis* (PCA) is one method that is widely used in image characteristic ekstrasi [1].

Subsequent research entitled "Prototype Based Face Recognition Time Attendance System with Eigenface Method". In this study the authors do to develop a prototype based attendance system *face recognition* with methods *eigenface* in real time. The system is packaged in a device that is run Raspberry pi Rasbian operating system. The prototype system developed consists of two stages: stage face detection and face recognition. The process of face detection method *template Matching*, Whereas at this stage of the method used facial recognition *eigenface* [2].

Furthermore, a study entitled "Comparison of Accuracy Level Frame Shape Using Templates Matching On Facial Recognition". This study was conducted to compare photos and assessed the accuracy of the form of the frame using Template Matching Method on Introduction to face [3].

Future studies with titled "Application Template Method Image Color Matching On". This research is to identify all the areas of the image containing a face without ignoring the three-dimensional position, direction, and lighting conditions by using Template Matching Method [4].

Furthermore, a study entitled "Based Attendance System, Face Recognition (Face Recognition) Method Using Eigenface". want to design and develop a system of absence through one of face recognition methods have fairly good accuracy by some previous studies, PCA (Principle Component Analysis) or often referred to Eigenfaces [5].

Future studies with the title "Face Detection Model Based Segmentation Using Templates Color Matching On Moving Objects". In this study image processing is done to improve the image quality, but with the development of the computing world characterized by increasing capacity and processing speeds of computers, as well as the emergence of computational sciences that allows humans to take information from an image, the image processing can not be released to the field *Computer Vision*. using Method *TMatching emplate* which serves to determine the areas where the skin color that is the face that will be processed into images that will be detected by the system [6].

Furthermore, a study entitled "The introduction of Facial Image Matching Method Using Templates". In this study the author makes an application to interpret an image and when the image processing in face recognition is done with the Template Method Matching Eigenvalue, eigenvector and Eigenface [7].

Future studies with the title "Human Face Detection On Digital Image Using Template Matching". This study makes Problems often encountered on the face detection problem can be caused by factors such as the position of the face that is the location of the position of an object in an image such as a face surface facing the frontal face the camera forward or reverse. The components of the face that can be present or absent as beard, mustache, and wearing or not wearing glasses. Hindered other objects for example in the image contains several groups of people. Therefore, the authors make a human face detection program on a digital image using Template Matching Method. Digital image of a familiar computer-related activities especially in the field of photography, films, medical, manufacturing ID cards and driver's license[8].

Furthermore, a study entitled "Faces Recognition for Attendance System Using Euclidean Distance Eigenface and Methods". The author makes an application in this paper the issue raised is how the computer that is connected to the web camera can recognize a person's face even though the person does not directly perform the attendance. This is done through the web camera is connected will make the process of recording and recognition of objects detected face in real-time. Then from the face recognition is used to update the presence status of a person in a place or space. The model is very suitable introduction as applied for absentee classroom teaching [9].

Furthermore, a study entitled "Partial Face Recognition by Template Matching". This paper presents a partial handling problems such as facial recognition processes, illumination, light scattering, blur faces,





for example, face recognition in random rotation deep. Differences face image caused by the rotation is often superior to the difference between people who are used to a different identity [10].

3. Research methods

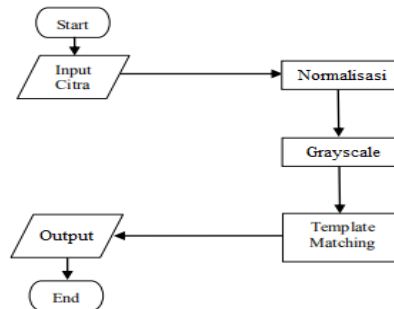


Fig 1. Process Flow Introduction facial image.

A. Caption

- a) input image
Incorporate the image into the application later, the image will be processed to the next stage.
- b) normalization
Changes in the application image into 3D in stages RGB (Red Green Blue), the process is done in the program.
- c) grayscale
Changes in the application into a 2D image in stages Grayscale. The process is done in the program.
- d) template Matching
This stage is where the comparison between the image is done.
- e) output
Results of the comparison image will appear closest resemblance to the image that is uploaded. With output percentage uploaded image comparison and image database.

B. Image Recognition

Image recognition is an image recognition technology that is currently in a period of development. These technologies include Machine Learning which serves to recognize the picture - the picture is registered in the database.

C. Template Matching

Template Matching is the process of searching for an object (template) in the whole object that comes in an image [7]. Template compared to the whole object of the unknown on the image of the object is then converted into a matrix. The comparison between the image of the entire image uploaded in the database can be done with the process as follows:

- 1) Examples of the image matrix:



Fig 2. Example of Face.



MATRIX CITRA UJI 3D

```
[[[255 255 255]
 [255 255 255]
 [255 255 255]
```

...

```
[145 130 104]
 [145 128 102]
 [143 126 99]]
```

```
[[255 255 255]
 [255 255 255]
 [255 255 255]
```

...

```
[143 128 102]
 [141 124 97]
 [139 122 95]]
```

```
[[255 255 255]
 [255 255 255]
 [255 255 255]
```

...

```
[139 125 97]
 [136 119 92]
 [134 118 89]]
```

...

```
[[ 50 38 34]
 [ 47 35 31]
 [ 43 31 25]
```

...

```
[ 35 35 21]
 [ 42 42 28]
 [ 45 45 31]]
```

```
[[ 55 43 39]
 [ 53 41 37]
 [ 48 36 30]
```

...

```
[ 35 35 21]
 [ 41 41 27]
 [ 42 45 30]]
```

```
[[ 55 43 39]
 [ 53 41 37]
 [ 48 36 30]
```

...

```
[ 36 36 22]
 [ 38 41 26]
 [ 40 43 28]]]
```

Fig 3. Matrix RGB 3D Face,

MATRIX CITRA UJI 2D

```
[[255 255 255 ... 124 122 120]
 [255 255 255 ... 122 118 116]
 [255 255 255 ... 118 113 111]
```

...

```
[ 38 35 31 ... 31 38 41]
 [ 43 41 36 ... 31 37 40]
 [ 43 41 36 ... 32 36 38]]
```



Fig 4. Matrix 2D Face Grayscale.

```

MATRIX CITRA LATIH1 2D
[[255 255 255 ... 124 122 120]
[255 255 255 ... 122 118 116]
[255 255 255 ... 118 113 111]
...
[ 38 35 31 ... 31 38 41]
[ 43 41 36 ... 31 37 40]
[ 43 41 36 ... 32 36 38]]
Akurasi Gambar :n1.jpg=9[[0.9999995]] %
Data Uji1 ke-9#163112700650099 Novialdi
Cocok dengan datalatih
UPDATE `tb_absensi` set `keterangan`='Data Uji1 ke-9#163112700650099 Novialdi#foto Uji ke 1','status`='Valid' where id_absen
si='10'

```

Fig 5. The matrix compared with other image matrix,

D. System planning

In the present study carried out stages that can be seen below:



Fig 6. Steps design.

- 1) Identification of problems
In this stage, the process of identifying the problems found in the study.
- 2) Study of literature
This stage is a reference search in the form of journals, national, international, Scopus indexed.
- 3) Data acquisition
Acquisition of data is the data collection activities. the data used is the image or images. Here are the characteristics required data:
 - a) The images used have a resolution of 750x1050 pixels,



Fig 7. Example of photos Face

- b) The objects used are images that are not hindered by other objects.





- c) Image capture is done in a closed room with sufficient lighting (≥ 200 lux), That is seen clearly. Sample photos can be seen in Figure 7.
- 4) Design
Research will be conducted by researchers in need of some data and facial image of students with student input facial image. Pixel size images to be conducted in this study was 750×1050 for the initial size and then will do the extraction process. Later trials will be conducted with several poses, attributes, and also the intensity of the light,
- 5) Implementation
At this stage include making program that consists of making the script and *interfaces* applications and trials to get the value of the accuracy of detection gamba, image recognition, and overall application. Validity test is done to test the level of reliability applications are built.
- 6) examination
Baseon test results application image is able to recognize images existing students. Analysis of the results also include how the detection of images at the room with a variety of lighting levels, the study was conducted testing in classrooms with poor lighting levels (> 200 lux) and what if rekonegsi carried out under a well-lit room (≥ 200 lux) and also the room with lighting > 400 lux, and also pay attention to the angle of the picture. In addition, the blackbox method is also used in testing this application. Test the following results:
- 1) Login

Button	scenario Testing	Expected results	result
Login	Clear all data, and then immediately click the "Login" button.	The system will deny access login and displays the message "Login Failed".	valid
Login	Emptying Data Username, and then immediately click the "Login"	The system will deny access login and displays the message "Login Failed".	valid
Login	Emptying the data password, then directly click "Login"	The system will deny access login and displays the message "Login Failed".	valid
Login	Filling all the data but one, then immediately click "Login"	The system will deny access login and displays the message "Login Failed".	valid
Login	Filling all the data but the wrong one, then immediately click "Login"	The system will deny access login and displays the message "Login Failed".	valid
Login	Filling all the data correctly, and then immediately click the "Login"	The system will receive access to login and displays the message "Login Successful".	valid

- 2) Upload

Button	Scenario Testing	Expected results	result
Upload	Clear all data, and then immediately click the "Upload" button.	The system will deny access login and displays the message "Upload Failed".	valid
Upload	Emptying one of the data, and then immediately click the "Upload" button.	The system will deny access login and displays the message "Upload Failed".	valid
Upload	Filling any of the data, and then immediately click the "Upload" button.	The system will deny access login and displays the message "Upload Failed".	valid
Upload	Filling all the data, and then immediately click the "Upload" button.	The system will deny access login and displays the message "Upload Successful".	valid





7) result

Based on these test results, the rate of testing the validity of the image recognition template matching method suitable to be applied for online student attendance.

4. Results and Discussion

a) display Interface



Fig 8. Home Ideas

See front page is the home page of the website online student attendance.

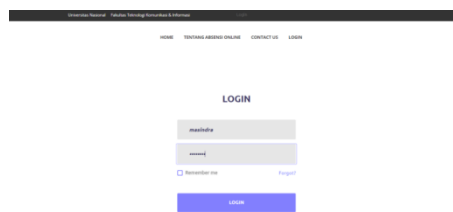


Fig 9. Display Log

Login page views diwebsite Students want to confirm their attendance. Here students perform appropriate login usernames and passwords that have been granted.



Fig 10. Main page during login

Results login main page after logging into the website Student Attendance Online,

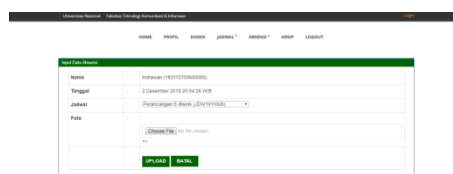


Fig 11. Student Attendance Page

The next display, the students perform in accordance Course attendance is running.

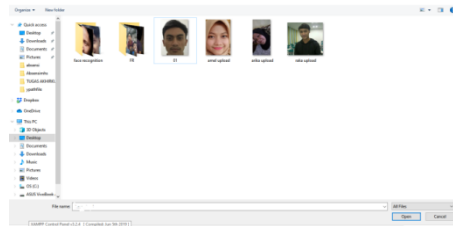


Fig 12. Select Image to Upload

Select the image file and uploaded to the website for Attendance.

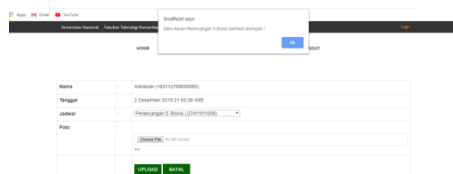


Fig 13. Figure successfully Upload

Once selected, click the Upload button and the image successfully uploaded, just waiting for the image processed by the system.

5. Conclusion

Based on the test results and analysis can be concluded as follows:

- The software can perform a comparison of the image files by comparing the value of the extracted *pixels* images are compared and the value *template* the extraction *pixels* the reference image.
- Template Matching method can be implemented in a facial image recognition software by means of extraction *pixels* images, process of extraction results into a form template and then compares it with the pixels of the image to be compared.
- Template Matching method can be used to compare the facial image photo well.

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