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Estimating The Age Of Human Face In Image Processing Using Matlab

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Abstract—Estimating human age automatically via facial Image analysis has lots of potential real-world application, such as human computer interaction and multimedia communication. It is rapidly entering in all the sectors and aspects of our life. In this work the identification of younger image and older image are Focused on the methods using MATLAB. First we extract certain features from the input Face images, later using different method like thresholding, segmentation, edge detection and thus we get related databases. Comparing several trained databases, we get a specific range for younger images and older images. From the proposed range we can identify the young and old face. Thus this paper analysis the younger and older images with a very high accuracy successfully using image processing.

***Index Terms*— Image Acquisition, Pre-processing, Background Subtraction, Filtering, Segmentation, Edge Detection.**

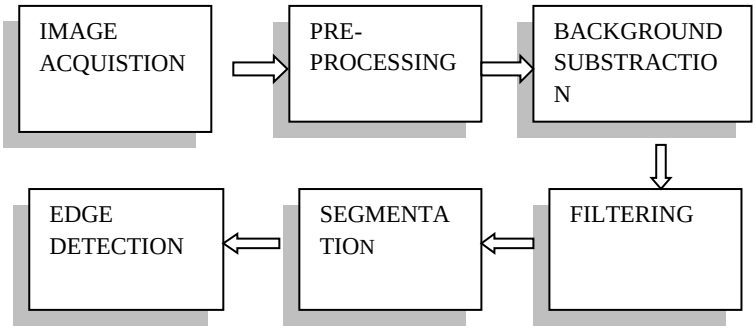
I. INTRODUCTION

Edge detection is a technology that uses set of mathematical rules to describe landmarks to identify human age. It typically determines the precise face area. Our aim is *to* determine the age of human beings of two different age groups through edge detection in image processing.

Edge detection approach is a very important area in the field of Computer Vision. Edges define the boundaries between regions in an image, which helps with segmentation and object recognition. They can show where shadows fall in an image or any other distinct change in the intensity of an image. The quality of edge detection is highly dependent on lighting conditions, the presence of objects of similar intensities, density of edges in the scene, and noise. While each of these problems can be handled by adjusting certain values in the edge detector and changing the threshold value for what is considered an edge, no good method has been determined for automatically setting these values, so they must be manually changed by an operator each time the detector is run with a different set of data. This paper is organized as follows:Skin Segmentation, Canny edge detection, Morphological operation, concludes the paper.

II. PROPOSED METHODOLOGY

The stages in the proposed methodology are shown below[1]



The steps involved in identification of younger and older skin quality of faces are image acquisition, pre-processing, segmentation, median filtering, canny edge detection. Finally the skin quality of human is identified.

III. IMAGE ACQUISITION

The image acquisition is done using a digital camera. It is loaded and saved using MIL software. MIL actually works with images captured from any type of colour or single chrome source. It supports file formats such as TIF (TIFF), JPG (JPEG), BMP (bitmap), as well as original or raw format. In our case the input image got is an RGB image.

IV. PRE –PROCESSING

Normally the images that are obtained from image acquisition may not be suitable directly for identification and classification purposes due to certain factors, such as noise, natural hazard, and poor resolution, artefacts, unwanted background etc. our aim is to use the established techniques and study their performance.
The steps involved in pre-processing are

a. Input image
b. Background subtraction
c. Converting RGB to grey
d. Converting gray to binary
e. Filtering.

A. RGB IMAGE

RGB is term as true colour images. Here the input image is represented with three matrices of same sizes matching the image format. The three matrices in each image represent one of the colours red, green and blue. It also says that of how much of each of these colours a particular pixel should use. From the input image we will we will get the final image using the steps we have already mentioned.

Ffig1.1 shows the input images of younger and older face.

FIG1.1 INPUT IMAGES

B.BACKGROUND SUBTRACTION

Background subtraction is a process of extracting the important part of the objects in a particular scene and omits the unnecessary back ground. As the foreground is the object of attention, it helps in reducing the amount of data to be processed.
Fig1.2 shows the Image after background subtraction of younger and older images.

Fig. 1.2 Images after background subtraction

C. GREY IMAGE:

Gray scale images contains a colour grey which consist of different shades between white and black .grey image can be termed as monochromatic image as is consist of a single colour. For converting any colour to a grey scale representation of its luminance, we should obtain the values of its red, green, and blue (RGB) primaries in linear intensity encoding, by gamma expansion.
Fig1.3 shows the grey images of younger and older faces.

Fig. 1.3 Gray images

D. BINARY IMAGE:

A Binary Image is a digital image in which the image has two assigned pixel intensity values. Only two colours used for a binary image are black and white. The grey image of faces are converted to binary image to represent each pixel as a single bit (0 for black or 1for white). We often get a Binary images in digital image processing as masks or as the result of certain operations such as segmentation, thresholding and dithering.

Fig1.4 shows the binary images of younger and older faces.

Fig. 1.4 Binary images

E. FILTERING:

The purpose of smoothing is to reduce noise and improve the visual quality of the image by blurring it up to a certain level. Smoothing

operation can be expressed as filtering as it filters the high intensity sharp components. We are using median filter for filtering our images for preserving edges.

F. MEDIAN FILTER:

The best known order-statistics filter is the median filter, which use neighbourhood operation to calculate mean value and replaces the value of a pixel. The expression is given as,

$$\hat{f}(x,y) = \underset{(s,t)\in S_{xy}}{\text{median}} \{g(s,t)\}$$

Here we include the original value of the pixel to compute the median. Median filters are mostly used because of their excellent noise reduction capabilities and considerably less blurring than linear smoothing filters of similar size. The actual vale of noise can never affect the median value as in this example [2][3][4]. The Median filter is specially important in removing isolated random noise, and to preserves edges and line features better than the Low Pass / Average filter without blurring.

Fig1.5 shows the filtered images of younger and older faces using median filtering.

Fig. 1.5 Filtered images

V. SEGMENTATION

Image segmentation is normally used to partition an image into some meaningful regions as necessary for a particular operation. The segmentation is based on the measurements taken from the experimental image and might be grey level, colour or binary. For this application we use edge based segmentation as that is most suitable. As edge detection is a fundamental step in image processing, it is necessary to detect the original edges to get the best results from the matching process. So the proper choice of edge detector is very important in this application. It is observed that canny edge detector is the most suitable for our application.

A. CANNY EDGE DETECTOR

Canny edge detection algorithm canis also known as the optimal edge detection algorithm. Canny's intentions were to enhance the many edge detectors in the image.

i. The first criterion should have low error rate and filter out unwanted information while the useful information preserve.

ii. The second criterion is to keep the lower variation as possible between the Original image and the processed image.

iii. Third criterion removes multiple responses to an edge.[5]

Based on these criteria, the canny edge detector works in following steps:

1) First it smoothes the image to eliminate the noise from it.
2) Then it finds the image gradient to highlight the regions with high spatial derivatives.
3) After highlighting it tracks along these regions and suppresses any pixel that is not at the maximum using non-maximum suppression.
4) Now the gradient array is further reduced by hysteresis to remove streaking and thinning the edge. .[6]

Fig1.6 shows the edge detection of younger and older face using canny edge detector

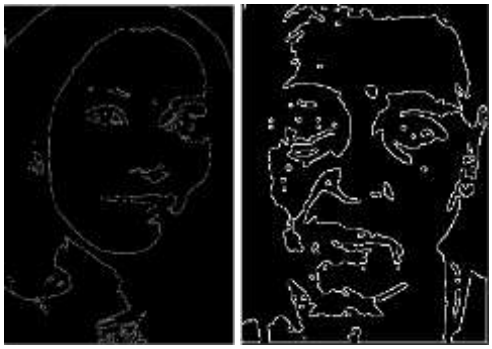


Fig. 1.6 Images with edge detection

VI. RESULT

In this section, a brief description about the experimental results is done. The programming environment used is Matlab2013a. First, the experiment is performed to detect the skin quality using edge detection. We have performed the experiment for both younger and older persons and achieved a satisfied result. The higher number of detected edge gives a more aged face.

VII. CONCLUTION

In this paper the identification of younger and older images based on edge detection in image processing using MATLAB is successfully done with 80% accuracy. By going through the above process, we can identify the quality of the skin. The use of image processing for identifying the quality of skin can be applied not only to the human face but also to other rough surface to identify the quality of the surface. Recognize the face from general view point under different illumination condition, facial expression, and aging effect.

REFERENCES

[1] S.Sridhar, "Digital Image Processing" First Published in,2011

[2] R. Yang, L. Lin, M. Gabbouj, J. Astola, and Y.Neuvo, "Optimal Weighted Median Filters Under Structural Constraints," IEEE Trans. Signal Processing, Vol. 43, PP. 591-604, Mar 1995 .

[3] Pei-Eng Ng and Kai-Kuang Ma, "A Switching Median Filter with BDND for Extremely Corrupted Images", IEEE Trans Image Processing, Vol. 15, No. 6, PP. 1506-1516 June 2006.

[4] Gajanand Gupta ,''Algorithm for Image Processing Using Improved Median Filter and Comparison of Mean, Median and Improved Median Filter", International Journal of Soft Computingand Engineering(IJSCE)ISSN:2231-2307,volume-1,Issue-5,November 2011

[5] R. Kalaivani, Dr. S Muruganand, Dr. Azha Periasamy "Identifying the quality of tomatoes in image processing using MATLAB." IJAREEIE, Vol 2,Issue 8th august 2013.

[6] Sonam Saluja et al.," A Study of Edge-Detection Methods", International Journal of Advanced Research in Computer and Communication Engineering. 2, Issue 1, January 2013