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THE HUMAN IDENTIFICATION SYSTEM USING BIOMETRICAL FEATURE IN EDGE BASED DIGITAL METHOD

M.Jansirani[1], Dr.P.Sumitra[2]
[1]Ph.D Research Scholar, [2] Assistant Professor
PG and Research Department of Computer Science and Applications
Vivekanandha College of Arts and Sciences for Women (Autonomous), Elayampalayam, Tiruchengode – 637205.

Abstract- *In this paper we study the implementation of an efficient fuzzy logic based algorithm to detect the edges of an input image by using MATLAB environment. We segmenting the images into regions by using 2x2 binary matrix. Fuzzy inference system designed has four inputs, which corresponds to four pixels of instantaneous scanning matrix. One output tells whether the pixel under consideration is 'black', 'white' or 'edge' pixel. Rule base comprises of sixteen rules, which classify the target pixel. Biometric technique is the study of methods for differentiating human beings. The human beings can be distinguished on the basis of physical or behavioral characteristics. In recent parts finding good biometric technique has been result human parts extensively. Among various biometric attributes, the reference line cut point, corresponding angles in addition to height of the human parts are the main parameters for the recognition of human parts. The captured human parts images can be improved by surrounding noise appropriate filter in addition to so the accuracy can be increased. This paper given image in addition to determine the shape. We can apply Canny Edge Detection by setting the threshold value. We can find the midpoints using distance formula. The Canny Edge Detection gives better performance than other method. We have applied the input gives easy in addition to stable way to identity a person. We can identify the outer curve of the human parts from the parts in ANN classifier for the classification of human parts. Finally, this study shows that it can be able to identify the human face.*

Keywords *– Image Processing, Biometric, Face Recognition, Segmentation, Neural Network*

I. INTRODUCTION

Biometric exploits as identification or verification by considering personality features that relates to an individual. [1][2] Biometric involves two types which are physical in addition to behavioral. Biometric refers to an automated system that can identify an individual by measuring their physical in addition to behavioral uniqueness or patterns in addition to comparing it to those on records. In other words, instead of requiring personal identification cards, magnetic cards, keys or passwords, biometric can identify fingerprints, face, iris, palm prints, signature, DNA, or retina of an individual for easy in addition to convenient verifications. Physical Biometrics focuses upon examining the biological in addition to the physiological features of the human being.

Human parts recognition technology is a potentially valuable tool in the biometric arsenal. An human parts Biometric system can be viewed as a typical pattern recognition system that reduces an input image to a set of features in addition to then compares this against the feature set of other images to determine its identity. Human parts recognition can be accomplished using either a 2D digital image of the human parts or a 3D point cloud that captures the human parts surface.

The proposed technique is able to detect human parts of the individual. [3] Image has been captured with high resolution camera in addition to it is in JPEG format. The cropped human parts image may be of varying size so the feature set of images can be vary. Hence the images are normalized to a constant size by resizing technique used for database. Each file in the database has images of the left human parts taken image resize 200*150.Five images per person have been taken in addition to stored for better accuracy.

The image firstly goes in pre-processing step. This includes gray scale conversion, median filtering to remove unwanted noise. Then canny edge detection is carried out on these images. The canny edge detector was applied to identify the main edges on the human parts image. We can get outer curve by setting the threshold value. Since the human part has quite a lot of ridges, it seemed like a suitable choice. We have used ANN classifier. It is classifier based on Artificial Neural Network.

MATLAB has been used for completing the method to extract features in addition to match the images to the database. The human parts are verified based on parameters extracted from the human parts using various image processing techniques. The human parts Recognition in addition to Verification is implemented using MATLAB. This work has been tested in addition to found suitable for its purpose.

II. PROPOSED SYSTEM

Biometric face recognition, otherwise known as Automatic Face Recognition (AFR), [4] is a particularly attractive biometric approach, since it focuses on the same identifier that humans use primarily to distinguish one person

from another: their "faces". Biometrics is the emerging area of bio engineering; it is the automated method of recognizing person based on a physiological or behavioral characteristic. There exist several biometric systems such as signature, finger prints, voice, iris, retina, hand geometry, ear geometry, and face. Among these systems, facial recognition appears to be one of the most universal, collectable, and accessible systems. The detection stage is the first stage; it includes identifying and locating a face in an image. There cognition stage is the second stage; it includes feature extraction, where important information for discrimination is saved, and the matching, where the recognition result is given with the aid of a face database.

The* Fig(1) *shown below the following is one possible high-level classification:

a. Holistic Methods: The whole face image is used as the raw input to the recognition system. An example is the well-known PCA-based technique.

b. Local Feature-based Methods: Local features are extracted, such as eyes, nose and mouth. Their locations and local statistics (appearance) are the input to the recognition stage. An example of this method is Elastic Bunch Graph Matching (EBGM).

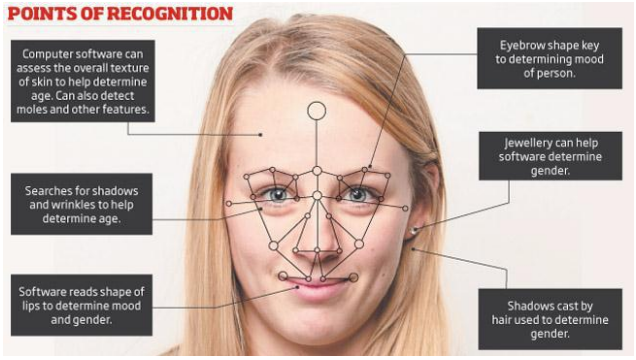

Fig. 1 Face Recognition Points

Among the different biometric techniques facial recognition may not be the most reliable and efficient but it has several advantages over the others: it is natural, easy to use and does not require aid from the test subject.

c. Applications are

1. Airports,
2. Multiplexes, and
3. Other public places can detect presence of criminals among the crowd.
4. Other biometrics like fingerprints, iris, and speech recognition cannot perform this kind of mass scanning. Humans are very good at recognizing faces and complex patterns.

d. Face recognition system can help in many ways:

1. Checking for criminal records.
2. Enhancement of security by using surveillance cameras in conjunction with face recognition system.
3. Finding lost children's by using the images received from the cameras fitted at some public places.
4. Knowing in advance if some VIP is entering the hostel.
5. Detection of a criminal at public place.
6. Can be used in different areas of science for comparing a entity with a set of entities.
7. Pattern Recognition.

In fig(2) shows the Face Recognition Procedure.

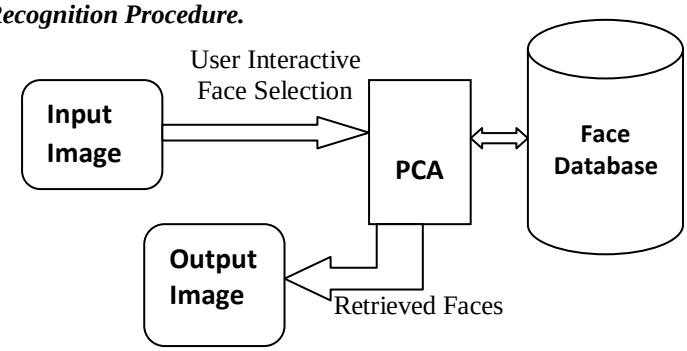

Fig 2 Face Recognition Procedure

III. PROPOSED SYSTEM ARCHITECTURE

3.1 Block Diagram

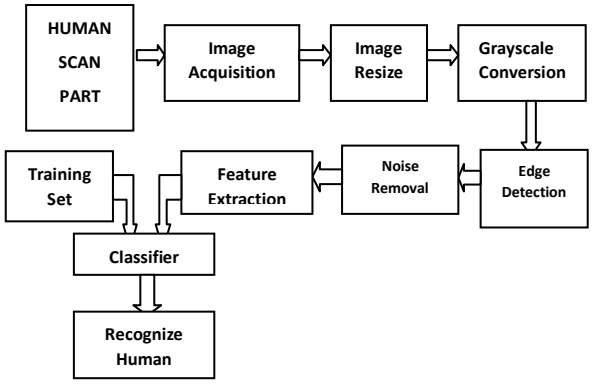

Fig 3. Block diagram of the Proposed system Architecture

3.2. Block Diagram of the Proposed System Description

3.2.1) Image Acquisition

i) Image has been captured with high resolution camera in addition to it is in JPEG format.
ii) We have captured all the human parts images at a distance of 8-10 cm.
iii) The images are captured in the same direction in addition to same intensity of light to get proper image.
iv) By increasing number of human parts images of same person, the accuracy level of identification will be increased.
v) We have collected all databases of left human parts. We have taken 5 images of each person to get a better accuracy.
vi) Image has been resized with pixel value 200*150 in addition to it is further preprocessed for feature extraction.

3.2.2) Pre-processing

i) Gray scale conversion
ii) Filtering
iii) Canny edge detection
iv) Noise Removal

3.2.3)Gray scale conversion

i) In this technique, the given true color RGB image is converted into the gray scale intensity image.
ii) Gray scale image carries only intensity information. It has many shades of gray in between.
iii) It eliminates the Hue in addition to saturation information while retaining the luminance.
iv) Hue is the color in the image in addition to saturation is the intensity or richness of that color.

3.2.4)Filtering

i) Filter is used to remove noise from the gray scale image.
ii) Median filter is used to remove unwanted information, somewhat like mean filter. However, it often does a better job than the mean filter of preserving useful detail in the image.
iii) This class of filter belongs to the class of edge preserving smoothing filters which are non in human parts filters. These filters smoothes the data while keeping the small in addition to sharp details.
iv) Consequently median filtering is very effective at removing various kinds of noise.

3.2.5) Canny Edge detection Procedure

1. We stored the highest value of the brightness in addition to the lowest value of the difference. If difference between the highest in addition to lowest value is greater than a particular threshold, then that particular pixel is considered to belong to an edge.
2. Canny edge detection is used to detect a wide range of edges in images.
3. It is most powerful edge detector as compared to other algorithm.
4. Canny uses thresholding. It significantly reduces the amount of data in addition to filters out useless information, while preserving the important structural properties in an image.
5. Edges in images are areas with strong intensity contrasts.

3.2.6) Noise Removal

Procedure for Noise Removal

1. After applying canny edge we can see there are several small connected components in an image to remove this we set the particular threshold value.
2. The pixel which is having value greater than threshold is eliminated.
3. The pixel which is having value less than threshold is considered. So we get the larger connected component.

3.2.7) Feature Extraction

Procedure for Feature Extraction

i) By scanning from top to bottom the first white pixel which is detected is considered as top point of the human parts. i.e. (Tr, Tc). Similarly, scanning from bottom to top first white pixel is detected to get bottom point. i.e. (Br, BC).Then dropping a line through top point in addition to bottom point we will get height of the human parts.

a) Mr = fix ((Br-Tr)/2)+Tr, (Mid of Row)
b) Mc = fix ((Rc-lc)/2)+ lc, (Mid of column)
c) Ht = Br-Tr, (Height of human parts)

ii) Human parts height line is the height of human parts, reference line are the lines which are parallel to the width of the human parts image which divides the image cell into (n+1) parts, where n is positive integer.

iii) The reference lines which intersect the edge of the human parts are considered as reference points.

iv) The angles from centre to each reference point is calculated. The number of angles is same as number of reference points. The calculated angles are unique for each person.

3.2.8) Classification

i) Input image is taken in addition to compared with the each saved images.

ii) For this purpose classifier is used, it is used to calculate the difference in Percentage between the input image in addition to the saved data.

iii) If the comparison results in less difference that means match is found in addition to the person is identified.

iv)We have used ANN classifier.

v) It is classifier based on Artificial Neural Network.

vi) In Machine human parsing ANN is a family of models inspired by biological Neural Network.

vii) ANN is generally presented as systems of interconnected "neurons" which exchange messages between each other.

IV. CONCLUSION

The fuzzy rule based algorithm over the other algorithms. The fuzzy rule based algorithm has been successful in obtaining the edges that are present in an image. The algorithm exhibits scope of application in various areas of digital image processing. This process includes determining larger outer curve of the human parts without applying curve fitting in addition to the threshold value is set using canny edge. ANN classifier is used which aims at improving the human parts recognition in addition to optimization system expected to have higher accuracy in addition to optimized results. The human parts detection algorithm is simple and has low computation complexity in MATLAB.

V. FUTURE ENHANCEMENT

In our technique, the image is first to be converted into gray image. This limitation can be eliminated and algorithm can be applied directly to color images, and the detection would then become significantly more complex.

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