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Baby Ear Image Recognization

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Abstract*— This paper to present ear biometric of my own baby ear image recognization. Whose age under 1year, & know the both right & left ear same feature or not. This is an automated system to solve the problem of baby missing, abduction & kidnapping. The implemented method consists of three stages. In the first step, pre-processing of ear is done. In the second step, features are extracted. In next step Extract poi, than matching is done between left, right and in 8month & 11 month (3 months difference) ear images of baby.

***Keywords*— ear biometric, edge detection, feature extraction, verification, identification**

I. INTRODUCTION

Biometric Baby swapping, missing ,abduction & kidnapping is an very big problem in world. various works done on biometric field to identifying new born baby using face, finger & palm prints of baby to few work on ear. Ear is only a part of body which is not change at long time with the growth of body after four months of birth by Iannarelli, an American scientist compared 10000 ear images, in 1949[1]. He also got a conclusion that different parson have different external ear and earlobe. The problem of missing children is a very serious issue in world and gives importance of this issue, in May 25 observed as National Missing Children's Day since it was first proclaimed by President Ronald Reagan in1983. Multiple ear biometrics are work for adults only & give us better result in case of identification.

The proposed technique is able to detect baby ear even know both ear difference is done. A images of the baby ear is taken and fed into the computer. The image goes in pre-processing step. Then edge detection is carried out on these images. From this detected edge shape of the ear, is separated.

Next the features like pixels count, mean, standard deviation, and skewness are extracted from the ear. Then Matching is being conducted between source & target ear and. This match is compared with a predefined threshold value, which decides the identity of the person.

II. GENERAL METHOD

The proposed system for baby identification by ear biometrics is shown in Fig.1

Initially source & target image is acquired through digital camera or other means. In the pre-processing step the image is converted to gray scale. Then using threshold a binary image is obtained. Then histogram image is generated. After that edge detection is used to detect the edges of the ear. Then all the features are extracted. Extract poi now the image is matched with the enrolled image for verification. Using this system we are find both right & left ear feature extraction & also identified the baby.

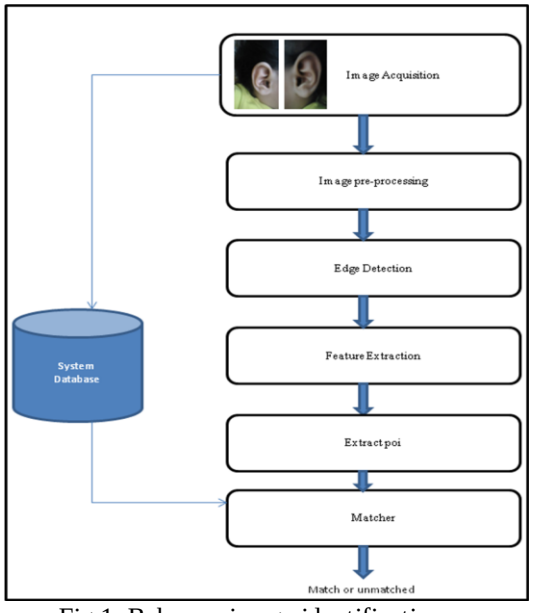

Fig 1. Baby ear image identification

III. METHODOLOGY DESCRIPTION

The ear image identification systems divided into five main parts - image acquisition, pre-processing, feature extraction, Extract poi, matching .

A. Image Acquisition

Data (images) are captured by Sony digital camera of 14.1 mega pixel . Figure 2(a) shows left ear images of my baby in 8 month. Figure 2(b) shows right ear images of my baby in 8 month. Figure 3(a) shows left ear images of my baby in 11 month. Figure 3(b) shows right ear images of my baby in 11 month. Data collected in difference of 3 months.

Fig. 2(a) baby left ear in 8 month

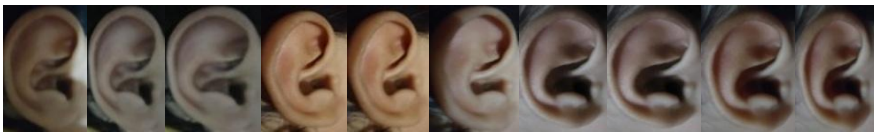

Fig. 2(b) baby right ear in 8 month

Fig. 3(a) baby left ear in 11 month

Fig. 3(b) baby right ear in 11 month

These data collected in 8 month & 11 month of own baby data captured in different light.
Generally babies are move so the data are not perfectly captured in same direction & same light. It's also a task to identify the shape of ear perfectly.

B. Pre-processing

It consist of four parts- Grayscale , Thresholding, Histogram, Edge Detection .

i) Grayscale: converts the truecolor image RGB to the grayscale intensity image. The RGB images to grayscale by eliminating the hue and saturation information while retaining the luminance. The cropped colour image is converted to grayscale image as shown in Fig. 4. A gray scale image is an image that contains only shades of gray.

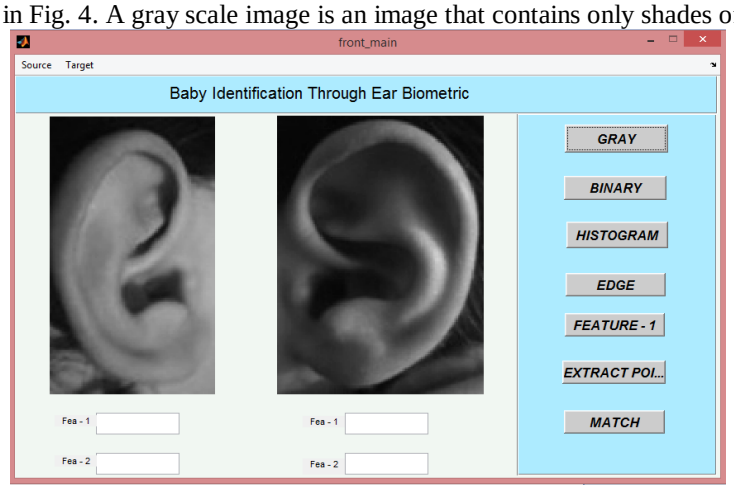

Fig.4 RGB to Gray conversion

ii) Binary conversion (Thresholding): Image thresholding is a matlab function which creates a black and white version of gray scale image by specifying a single threshold value; pixels below this value become black, and above this value they are white. Binary conversion as shown in Fig.5.

Fig.5 Gray To Binary conversion

iii) Histogram: Histogram displays the bins as rectangles such that the height of each rectangle indicates the number of elements in the bin .A histogram is away to graphically represent the distribution of data in a data set. Each data point is placed into a bin based on its value. The histogram is a plot of the number of data points in each bin. In scientific experiments, histograms are useful in characterizing the spread of data from repeated trials and for determining the probability of given measurement. As shown in fig.6.

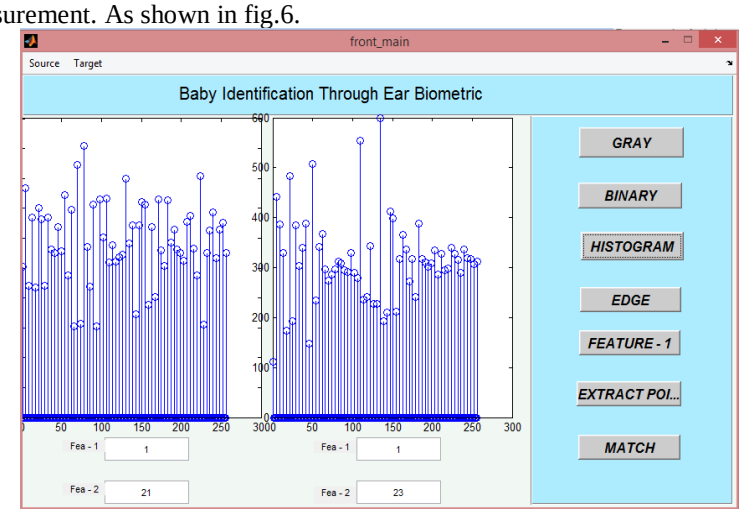

Fig.6 Histogram

iv) Edge Detection: Edge Detection an image, an edge is a curve that follows a path of rapid change in image intensity. Edges are often associated with the boundaries of objects in a scene. Edge detection is used to identify the edges in an image. The most powerful edge-detection method that edge provides is the Canny method. Which is used in this system, The Canny method differs from the other edge-detection methods in that it uses two different thresholds (to detect strong and weak edges), and includes the weak edges in the output only if they are connected to strong edges. This method is therefore less likely than the others to be fooled by noise, and more likely to detect true weak edges. Canny Edge detection as shown in fig.7.

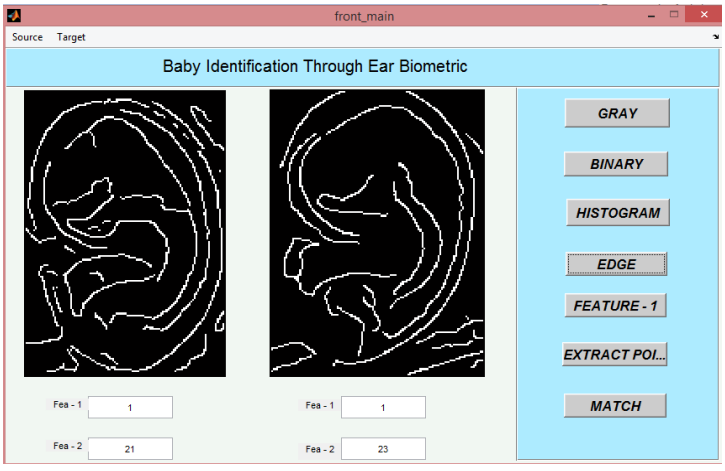

Fig.7 Canny Edge Detaction

v) Feature Extraction: After edge detection, calculation is done to count the number of black and white pixel in an image.It calculates the mean value of image stored in a form of matrix. It is the average distance from the mean of the data set to a point. The way to calculate it is to compute the squares of the distance from each data point to the mean of the set.It returns the skewness (it is a measure of symmetry) of the image. A Distribution, or dataset, is symmetric if it looks the same to the left and right of the centre point. Feature extraction1 as follows in Fig.8.

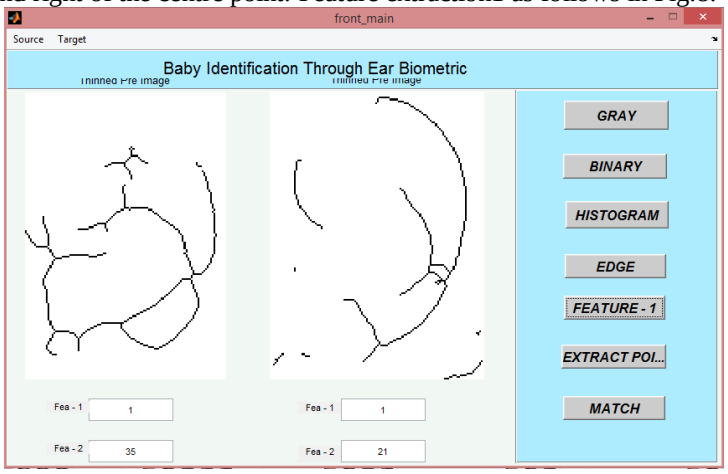

Fig.8 Feature extraction

vi) Extract POI: The function derives the descriptors from pixels surrounding an interest point. The pixels represent and match features specified by a single-point location. Each single-point specifies the center location of a neighborhood. The method you use for descriptor extraction depends on the class of the input points. Extract poi of ear as shown in Fig.9.

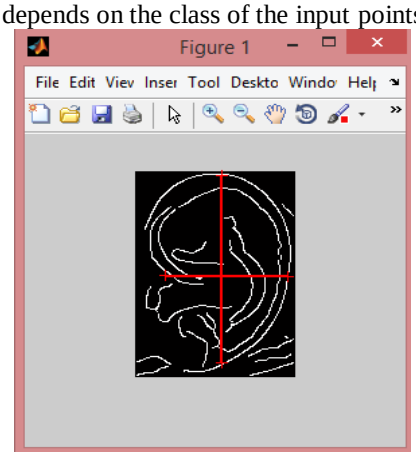

Fig.9 Extract POI

Vii) Matching: After extraction of required features from the ear image, matching is done. Source image is the baby in 8 month left ear image. The target image is baby in 11 month left ear image . Source and target image is compared on basis of pixel count and mean of the two images. As shown in Fig.10.

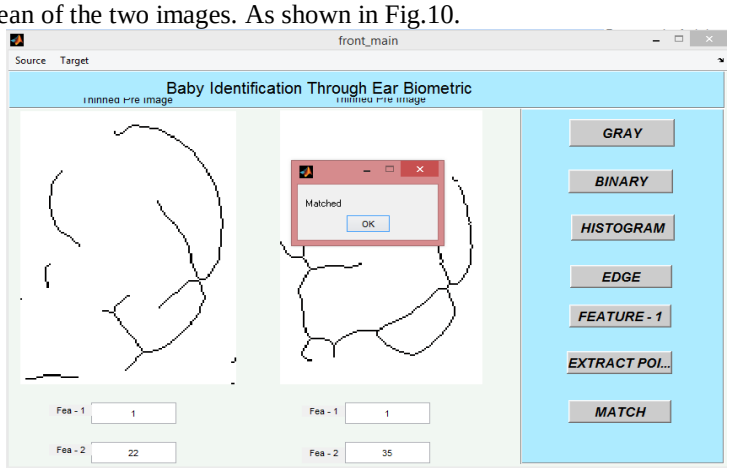

Fig.10 Match Found

Feature extraction of left & right ear which having different features are as shown in Fig.11.
These feature Extraction shows that the both ear not have same features.

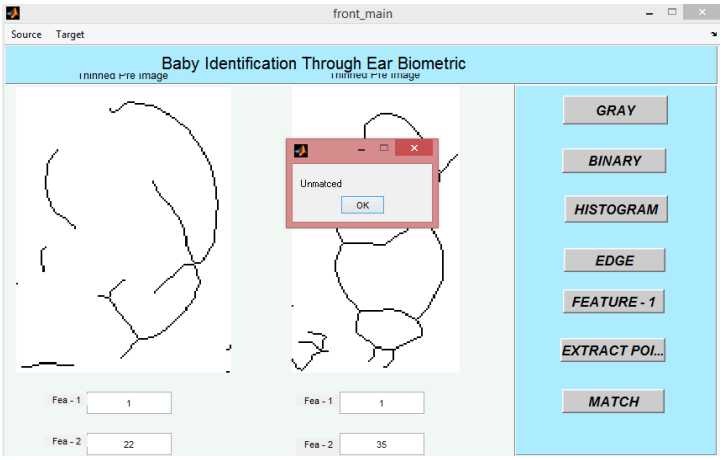

Fig.12 Unmatch found in case of both left & right ear

IV. RESULT

In this section we use the input GUI, for pre-processing, feature extraction and verification of a baby ,experimental results i.e. mean difference, matching percent of ear.

Fig.13 mean difference, matching percent of ear.

IV. CONCLUSION

The approach consists of five stages such as image acquisition, pre-processing, feature extraction, Extract poi and finally ear feature matching. To identifying baby & to detect the ear shape not change after 4 month of birth. 3 month difference (8&11) ear images data of my own baby are matched & verify the data are same feature in 1 year baby so this ear biometric can use to identify the baby in case of missing, abduction. The ear detection algorithm is simple and, hence, has low computation complexity in Matlab R2014a.

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