Identity Recognizing using Iris Scan with multiple frames of Video

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***Abstract*--- The field of iris biometrics has been significant research over the last decade. At this point, iris capture has become a main stream technology with wide acceptance. A general iris recognition system works with four different steps. 1. Capturing the image from the eye. 2. Extracting iris from the processed image. 3. Transforming the raw image coordinates into normalized polar coordinates. 4. Finally the iris code is compared with known iris code for identification of a person. Iris performance can be improved by creating a single average image. We prepared two different sets of images called gallery set of images and probe set of images and then compared all gallery set images to all probe set images. This comparison gives better recognition performance.**

***Key words*:** Iris Recognition; Iris Video; Image Averaging.

I INTRODUCTION

In the present generation iris recognition system is the best way to go for human identification. It is consider to have the best results along with DNA pattern recognition. The iris can be extracted from eye images. There are four features that enhances iris important in automatic identification. 1. It is protected from the external environment since it is internal organ of the eye. 2. Impossibility of surgically modifying without the risk of vision. 3. Physiological response to light. 4. Ease of registering its image at some distance.

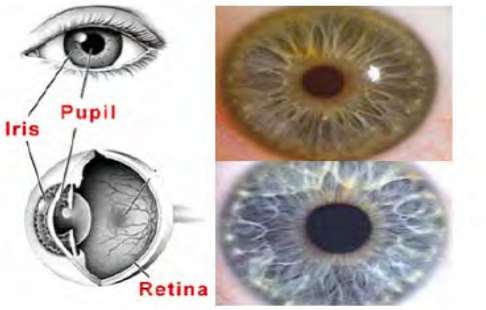

Figure: 1. Iris of eye image

The iris is small in size and dark in color. Iris is extracted from the image of the eye, so acquiring the image from eye is an important step in the iris recognition system. Most of the research work in iris system relies mainly on constant iris images [1]. There are some drawbacks in using single constant image as well as with multiple constant images. First one is the single constant image have a moderate amount of noise because of eye lashes and boundaries of eye lids. Second one is because of eye lash occlusion there is a chance of losing some

important texture information present in the constant images. Third is it is not possible to combine multiple constant images to produce a better image in order to get best iris. Fourth one is by comparing two constant images there is a chance of increasing hamming distance between the images.

II RELATED WORK

In the present research work in iris recognizing system video frames are playing a vital role. Video has been used effectively to improve iris recognition. A book by Zhou and Chellappa studied a number of methods to employ video in Iris biometrics [2]. By using video application we can have several eye images, this Video application need high processing speed per frame. The video frames may contain bad quality images like images without an eye, images with a blinking eye, motion blur images and out of focus images etc.

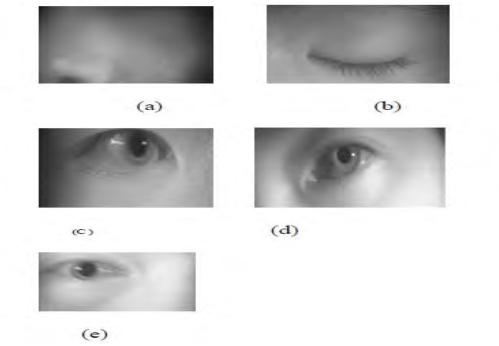

Figure: 2. (a) without an eye (b).blinking eye (c).motion blurs
(d). Out of focus (e). Combination of motion blur and out of focus.

A recent work by Zhou .et.al presented a paper [3] [4] that include dividing the iris video frames into five different groups. This division is based on the quality of the image. This paper showed that a quality image gives low error rate in the iris performance.

III SYSTEM MODEL

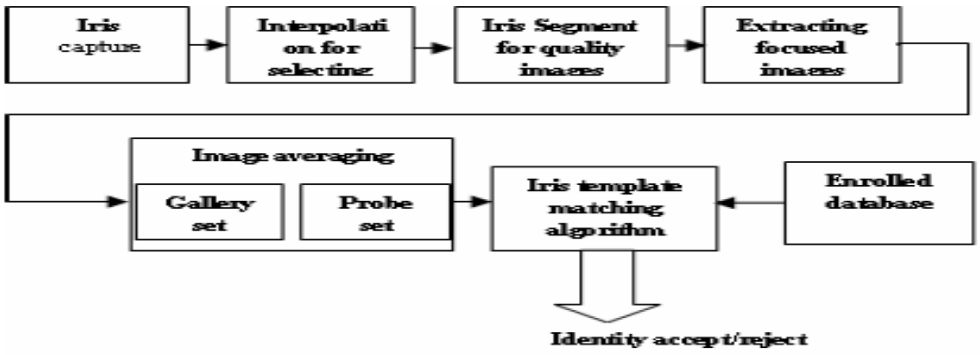

Figure: 3. Iris system model

Our system begins with capturing of several eye images of a person in the form of video frames. To have the best frames from video we use interpolation technique to discard blink, blur and frames without an eye. The selected frames are segmented by applying canny edge detection and Hough transform [6] to get the quality images. The system works on the focused images. Now by using the focused images a single average image is developed. In order to get focused images we used a technique proposed by Daugman [5]. The single average image combines iris texture from multiple qualities and focused images.

To get the single average image we have to combine several unwrapped iris images and we wanted to make sure they were aligned correctly with each other, to avoid horizontal shift in the unwrapped iris texture. The best alignment method used here is the naive assumption that people would not actively tilt their head while the iris video being captured and thus assumed that no shifts were introduced.

Even though we selected the quality images some parts of the unwrapped images may contain occlusion by eye lids and eye lashes. So eye lid regions are masked in our images. But too much masking is not preferable. Because of too much masking some important texture information may loss. To get better average image, use more number of frames for averaging. In our paper we use ten frames for averaging. The averaging method we used here is a mean rule.
The averaged image is applied to iris matching algorithm where it is compared with the enrolled images from the database. Based on the result of the algorithm a person is identified.

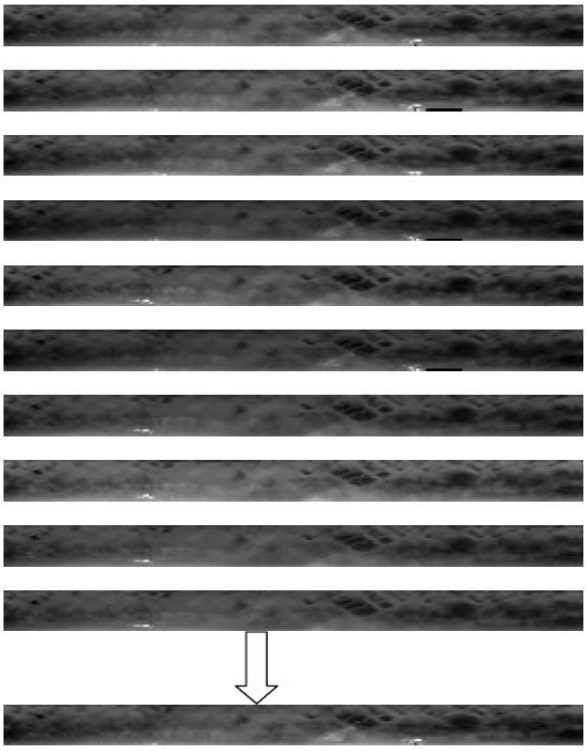

Figure: 4. Averaged image from ten original images

IV PERFORMANCE

Iris performance can be improved by creating a single average image from the multiple video frames. To create an average image we selected four frames of focused images and we prepared a set of four frame average images named it as a gallery set. And we also made another set called a probe set which contains another four frames of average images.

The same procedure is repeated for six, eight, nine and ten frames. And we observed that with increase in the number of frames, the iris performance is increased. This is observed from the following graph.

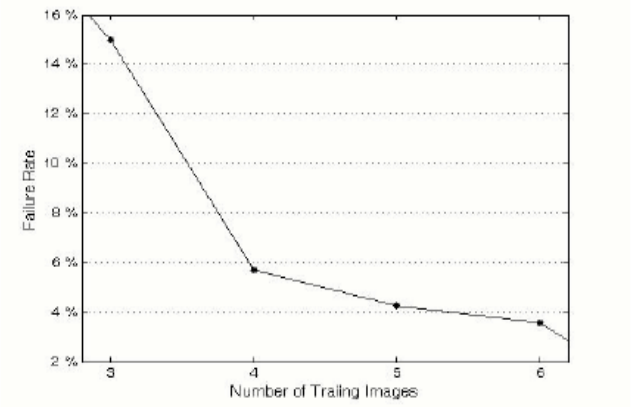

Figure: 5.Number of frames Vs failure rate

V FUTURE WORK

A critical performance parameter is the iris image in the iris identification system. To get more clear and quality iris images we need to work on co-operative data.

VII CONCLUSION

In this paper we have presented a video based iris recognition method. This method is based on the averaging of multiple video frames and then we compared set of images in gallery with images in probe set and observe better recognition performance.

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