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Biometric Voting Machine with Retina Recognition System

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ABSTRACT: In this paper,the design and development of a biometric Electronic Voting System. The suggested iris voting system allows the user to scan his iris, in order to check his eligibility by comparing his current iris with the one already stored in the system's database, by the use of MATLAB®. Once the users complete the identification process, they will be allowed to cast their vote using friendly geographical user interface.The counting of the votes will be immediately and that makes the voting process efficient, fast, and secure.

KEYWORDS: Electronic voting system, Bio metric.

I. INTRODUCTION

In democratic countries, voting is one of the important aspects. It will help in revealing the opinion of certain group on an issue. Voting process is generally done manually using paper based ballot papers. Most of the times in traditional process of voting, there are more chances of occurring error while counting votes and most of time voters looks for to cast their votes more than once [1]. From past few years, voting is shifting from manual paper-based process to automatic electronic-based process. The term "electronic voting" characteristically depicts to the use of electronic means in voting and it ensures the security, reliability, guarantee and transferency [2-3]. As compare to traditional paper based voting, electronic voting is considered to have more potential.

The primary goal of electronic voting system is to reveal the opinion of group of people during the election. Thus security provided by this electronic system is at stake. Many systems were developed to address the above problem. But studies have shown that most of the electronic voting systems being used today are fatally defective and that their quality does not match the importance of the task that they are supposed to carry out [4-6]. So various standards were set too developed electronic systems which focused on ameliorating security primitives, such as the storage of votes [7] and auditing [8], and on formally assessing and making procedures more effective [9].

So many systems were developed to meet these standards.These systems have consider unique features of human race like fingerprints,iris, face detection etc. Biometric of human being is considered while developing the systems.Thus more security features were added to ensure the safe and effective voting.

II. RELATED WORK

In [10] author proposed system based on complete biometric traits of voter which were saved in a government database as Aadhaar (U-id) number database. These biometrics traits provided secure and feasible authentication to the voters. Biometrics prevents the fraud and illegal voting. The system was vulnerable to security attacks.Confidential biometric data may be leaked due to network connectivity or system hacking.Authentication is done by voter list of voters at that polling station.This authentication is completely on paper based.Another system was developed in [12] same kind of system with one added feature of detecting any alcoholic person if enters in the voting area. In this, two step verification goes on. In 1st step,RFID tag is verified with data base of LPC2148 to check weather the person belongs to that particular polling booth or not. In 2nd step, Finger print scanner is used to check weather the voter is original or not..All these connection are made on hardware,anyone can be interchange this connection. In the [14]

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system which removes the limitation that if a person is not in his constituency then he cannot vote. Centralized database was maintained according to their consistency.System provided RFID and biometric security. A RFID card would be provided to each voter. RFID card has a unique 12 byte code which could be read by RFID reader. A person can also use his fingerprint for unique identification

III. PROPOSED ALGORITHM

A. Research methodology :

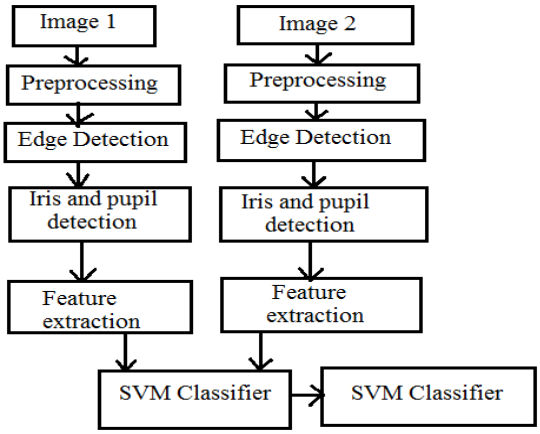

Fig.1 Block diagram

In this we proposed system and software implementation.It will discuss the image pre-processing methods. It browses the image processing steps. In addition, the segmented image of pupil we get. Iris normalization and unwrapping method this images results review.

1) Image collected

An image is an array, or a matrix, of square pixels (picture elements) arranged in columns and rows. A new dataset of iris images obtained in visible light using a mobile phone. Apple iPhone 5s has been chosen as the capturing device due to its high quality 8 megapixel sensor and a large lens aperture of f/2.2. These images must be in the JPEG,JPG to process in MATLAB software.

2) Preprocessing

The iris image is first resized to a particular size.The noises in the frames reduces the quality of the frames. Each frames are considered as images. In order to improve the quality of the images we normally employ some filtering operations. Median filter is used for filtering.

3) Edge detection

Edge detection refers to the process of identifying and locating sharp discontinuities in an image.The discontinuities are abrupt changes in pixel intensity which characterize boundaries of objects in a scene. Classical methods of edge detection involve convolving the image with an operator.The Canny edge detector is widely considered to be the standard edge detection algorithm in the industry.

4) Segmentation

Morphological Segmentation is an image that combines morphological operations, such as extended minima and morphological gradient, with watershed flooding algorithms to segment grayscale images of any type in 2D and 3D.

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5) Feature extraction

The gabor extracts the feature values from the Iris image.The algorithm identifies the clearly visible edges from the Iris image and mark them and get the values from them. These values were used to generate the texture for the images. Applications of GABOR features include object recognition, robotic mapping and navigation, image stitching, 3D modeling, gesture recognition etc

6) Iris classification

Support vector machines are supervised learning models with associated learning algorithms that analyze data and recognize patterns, used for classification and regression analysis.The basic SVM takes a set of input data and predicts, for each given input, which of two possible classes forms the output.

7) Performance measures

The performance of the system is measured by calculating the accuracy, Sensitivity and specificity of the classifier. The accuracy of the classifier represents to which extend the classifier classifies the images based on the given label. The sensitivity of the classifier represents how exactly the classifier correctly classifies the data to each category. The specificity of the classifier represents how exactly the classifier correctly rejects the data to each category.

$$\text{Sensitivity} = \frac{\text{TP}}{(TP + FN)}$$

$$\text{Specificity} = \frac{\text{TN}}{(FP + TN)}$$

$$ACC = \frac{(TP + TN)}{(FP + TN) + (TP + FN)}$$

B. Security codes assign to each party

In order to safe vote from getting fraud security codes are assign to each parties.When person are authenticated only then voting panel will be display.In this project, to safe voting different security signs are assign to each party.Votes of person can not be interconnected with each other.There are five parties in our projects then five different security codes are assign.

For party 1 - * sign is assign
For party2 - @ sign is assign
For party3 - $ sign is assign
For party4 - && sign is assign
For party5 - # sign is assign

IV. SIMULATION RESULTS

The proposed system is implemented with MATLAB.Each iris image is taken and compare with the dataset which is already store.If the person is not authenticated then message will be display as not authenticated.If person is not authenticated then message display as " Not authenticated".then he/she can not allow to vote.Voting panel can not display.The voting panel display as shown in fig.2 below

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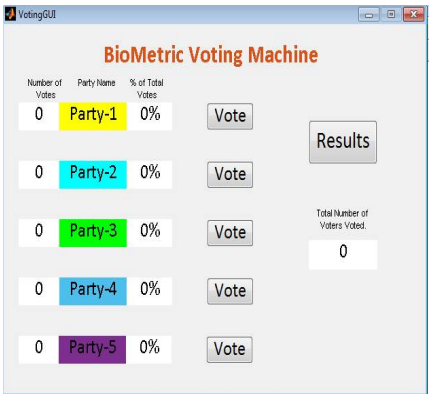
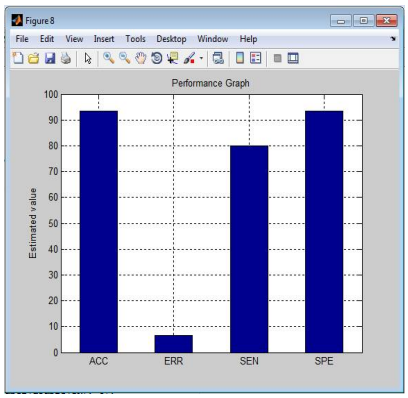


Fig.2 Voting panel



Graph 1.Performance graph

The selected image compares with the dataset then some parameters are taken into account.The performance of system is measured by calculating the accuracy,sensitivity and specificity of the classifier as shown in graph 1.In all these cases,there is some parameter we wish to know the value of this.This is called true value.The method provide a measure value,that we want to be as close to the true value as possible.Accuracy is the difference between the true value and value generated from the data given.Sensitivity measures the proportion of positives that are correctly identified.Specificity measures the proportion of negatives that are correctly identified.Sensitivity and specificity are statistical measures of performance of binary classification test.This is also known in statistics as classification function.

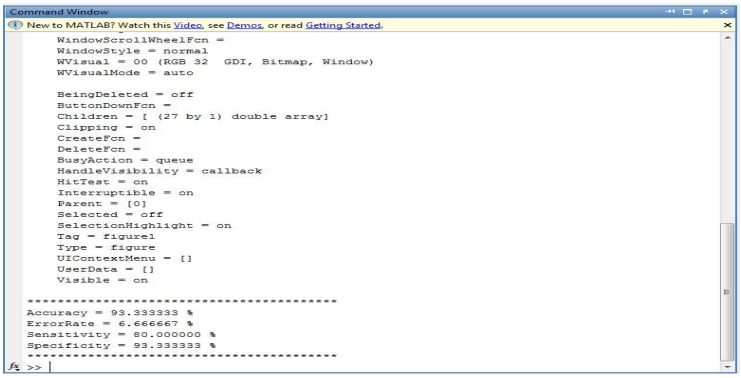


Fig.3 Command window

If the person is authorized or unauthorized,then the performance measure is estimated the values of different parameters.In the above the accuracy is 93.33% shown.This accuracy represents the measure of which how data given is close to the true value.Error rate is 6.66%.The number of received bits of data that have been altered due to noise,interference,distortion.Sensitivity is 80%.It determine how imade or data are sensitive to specific condition.Specificity is 93.33% as shown in fig.3.It determine how exactly the classifier correctly rejects the data to each category.Depending on the data of images given to the system performance parameter value will changes.All these parameters value will be display on command window of MATLAB.

V. CONCLUSION AND FUTURE WORK

The proposed system recognizes the iris of the persons in the dataset based on the features extracted using GABOR.The recognition of the iris is done using the kernel function of the SVM classifier. The proposed system gives

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accuracy which is higher than the existing algorithms.In order to increase both accuracy and robustness; a multimodal biometric systems could be used.

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