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ONLINE VOTING SYSTEM USING EYE MATCHING

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Abstract: *India being a democracy that too world's largest, still conducts its elections using either Secret Ballet Voting or Electronic Voting Machines (EVM) both of which involves high costs, manual labour and are inefficient. So, the system must be optimized to be made efficient which would not leave room for unwanted means of voting. The most familiar issue faced by the election commission is inappropriate confirmation with respect to the arrangement of casting the votes, duplication or illegal casting of votes. The proposed biometric electoral authentication system allows the user to scan s so that his or her credentials can be compared to existing iris images already stored in the system's database. Present Aadhar database will be integrated into voting authentication system. Using detection of iris based authentication decreases the chance of duplicating a vote and those who are registered prior to the election and are recognized by the system will be allowed to vote. Hence, the approach makes the system the best way to vote. In this paper, biometric based authentication avoids anonymity and the focus is on making the voting system more robust and reliable by eliminating dummy voters. By using Daughman's algorithms will scan **IRIS** and check those details in our database for match.*

Keywords: *Online voting system, IRIS database, detection of iris*

I. INTRODUCTION

The electoral mechanism is the cornerstone of any democracy. The depth of Democracy is voting. The voting system must be reliable, and the report of vote casting must be accurately and reasonably recorded. The realization of democratic administration is dependent on the election results. The election process gives every citizen of any country the right to choose a good representative from among them who can bring the democratic mechanism

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closer to the welfare of society. The voting machine has undergone many significant changes recently, from traditional balloting to electronic voting [1].

Voting is now closer to online voting. The voting device improves class by the score; the Development of the new machine eliminates the shortcomings of the old system. Each device attempts to overcome the annular holes of the previous device. The first objective of this document is to familiarize the traditional voting machine with the recently proposed voting instrument. In the modern world, many new strategies, including the method of voting, play a vital role in any democratic system. Democracy is supposed to allow people to vote freely and for the results of elections to occur regularly through citizen organizing [2].

The iris contains many collagenous fibers, contraction furrows, coronas, crypts, color, serpentine vasculature, striations, freckles, rifts, and pits. Measuring the patterns of these features and their spatial relationships to each other provides other quantifiable parameters useful to the identification process. Statistical analyses of iris indicate that the IRT process uses 240 DOF (Degree of Freedom), or independent measures of variation to distinguish one iris from another. The availability of these many degrees of freedom allows iris recognition to identify persons with an accuracy that is greater than other biometric systems. When a person wishes to be identified by an iris recognition system, their eye is first photographed, and then a template is created for their iris region. This biometric template contains an objective mathematical representation of the unique information stored in the iris, and allows comparisons to be made between templates. This template is then compared with the other templates stored in a database until either a matching [3].

II. LITERATURE SURVEY

"Smart Voting" is used to identify people who are trying to vote a second time, and once the fingerprint print and iris are scanned, authentication is complete, and the user is locked into login[4]. Face detection, which is the major part of this project is done by using the Haar Cascade method. It is a machine learning object detection algorithm used to identify objects in an image or video. The process of election data is recorded, stored and preceded as digital information. Electronic voting system is used to fling vote as well as counting number of votes. The electronic voting system uses AVISPA technique Canny Edge detection algorithm for localizing the iris and pupils. Iris recognition system consists of five stages, such as, image acquisition, segmentation, normalization, feature extraction and matching[5]. In security of voting system by bringing advanced technologies of neural networks with multimodal biometrics (face recognition, fingerprint scan, retina scan etc).

Iris recognition refers to the automated method of verifying a match between two human IRIS. Iris scanner Capture the iris image and compare or match to database. RFID tags have been used. Each and every tag contains the information related to individual voters. The voter identity card is replaced by smart card in which all the detail of the person is updated. Only the specified person can poll using their smart card. The incorporation of biometric technologies can be as simple as using a single biometric. However, a single biometric measure is always subject to security breaches, if not properly attended and administered.

Human iris possesses genetic independence and contains extremely information-rich physical structure and unique texture pattern which makes it highly complex enough to be used as a biometric signature. Statistical analysis reveals that the iris is the most mathematically unique feature of the human body because of the hundreds of degrees of freedom it gives with the ability to accurately measure its texture. Reliable biometric verification and identification techniques based upon iris patterns have been presented by Johnston [6], Daugman ,Wildes et al. Other known iris recognition systems have been introduced by Zhu et al, Lim et al, Noh et al., Tisse et al and Ma et al. Motivated by these works, several researchers worked on enhancing the performance of iris recognition systems. Some researches focus on improving the image acquisition systems, some deals with enhancing the segmentation algorithms, others are devoted to improving the features extraction and encoding process. In biometrics in general, it has been found that using multiple images for enrolment and comparing the probe to multiple gallery samples will result in improved performance. Several papers show that this is also true for iris recognition. Du performed experiments using one, two, and three images to enroll a given iris. The resulting recognition rates are 98.5%, 99.5%, and 99.8%, respectively [7].

Liu and Xie presented an algorithm that uses direct linear discriminant analysis. Their results using 1200 images showed that recognition performance increases dramatically in going from two images per iris to four images, and then incrementally from 4 to 8, and 8 to 10. Algorithms that

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use multiple training samples to enroll an image must decide how to combine the scores from multiple comparisons [8]. Ma et al. suggested analysing multiple images and keeping the best-quality image. The same authors, reported that the average of a three scores is taken as the final matching distance when matching an input feature vector with three templates of a class [9]. Krichen et al. represent each class in the gallery with three images, so that for each person and for each test image, they kept the minimum value of its similarity measure to the three images. The use of the min operation to fuse a set of similarity scores is generally more appropriate. Considering multiple scans of an iris, Schmid et al. used the average Hamming distance of multi-sample matching. This is compared to using a loglikelihood ratio, and it is found that, in many cases, the log-likelihood ratio outperforms the average Hamming distance [10].

III. PROPOSED METHODOLOGY

The iris is accurate. However, so many elements are involved in making up these textures (iris) that the risk of wrong settings for any of them is shallow. Even genetically identical individuals have a completely independent iris. The character being recognized does not have to touch any device recently connected by a stranger, which rules out the objection raised in some cultures against fingerprint scanners, where the finger must touch a scanning surface or retina, where the eye must be entered near the lens (such as looking directly into the microscope).

We use a biometric machine for the proposed voting technology that uses a pair of biometric behaviour assets. This can be achieved by combining multiple characteristics of one or more personalities with bio-extraction and matching algorithms that run on identical biometrics. This machine improves the accuracy of matching biometric device records in the voting procedure. Since there is no way for a candidate to initiate biometric data issued by the authorities before an election takes place, we use iris recognition and fingerprint scanning for an affordable and accurate final voting result.

In this system we authenticate the voter using iris recognition system to make the system more robust and secure and leave no room for duplicate voting. Our proposed voting system is depicted as Firstly, we check the iris database from the smart card. On that time, the voting record of a voter is also checked. If the voting record shows the voter gives vote, then he/she cannot allow for voting. If the voting record shows that the voter cannot give vote then capture the voter iris image

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by using iris scanner camera. Match the captured iris image and smart card iris image database using hamming distance. If the iris image is not matched to the smart card database, then stop the process. On the other hand, if the iris image is matched to the smart card database, then allow the voter to give a vote and update the voting record of the voter. Voting system checks the iris database from the registered user. On that time, the voting record of a voter is also checked. Iris images are used to register every user by admin and using same image user need to register if not user cannot login. After OTP verification is done user can vote for candidate

IV. SYSTEM DESIGN

SYSTEM ARCHITECTURE

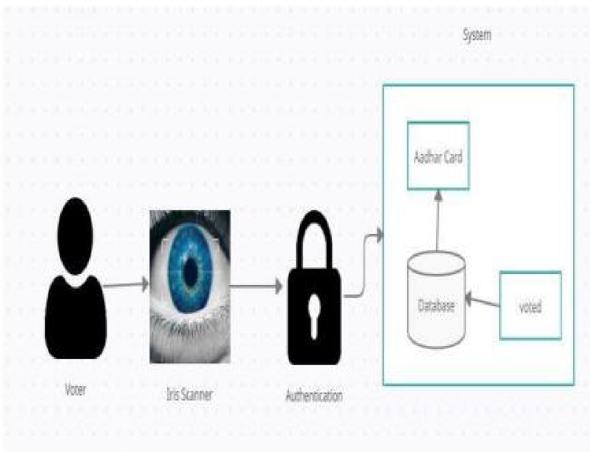

Fig.1 System architecture

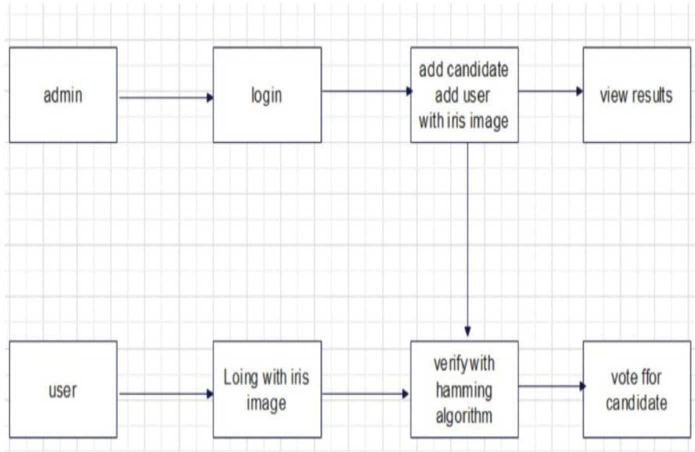

Fig.2 Block diagram

System Design Introduction:

The System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, human machine interfaces, detailed design, processing logic, and external interfaces.

Algorithms:

The effectiveness of the proposed technique is demonstrated by performing a comparison between the matching result of the proposed method and the conventional method. Each of the five images of an eye is matched with the other images (of the same eye including the image itself) and with the fused template of that eye. A sample of the results is plotted in where a Hamming distance value of 0 is obtained, as expected, when an image is matched with itself. However, the Hamming distance obtained when an image is

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matched with each of the other four images of the same eye is always higher than the Hamming distance obtained when matching the image with the fused template. This observation implies that the performance of an iris recognition system based on the proposed fusion strategy is better than the performance of the conventional strategy whenever the introduced image of an eye is different than the image enrolled previously in the database.

A) IRIS RECOGNITION SYSTEM

The iris recognition process consists of five major steps. The first step is the image acquisition of a person's eye at enrollment time or check time. The second step is to segment the iris out of the image containing the eye and part of the face, which localizes the iris pattern. Step three is the normalization; here the iris pattern will be extracted and scaled to a predefined size. Step four is the template generation; here the details of 20 the iris are filtered, extracted and represented in an iris code. The last step is the matching phase, where two iris codes will be compared and a similarity score is computed. These steps are shown schematically

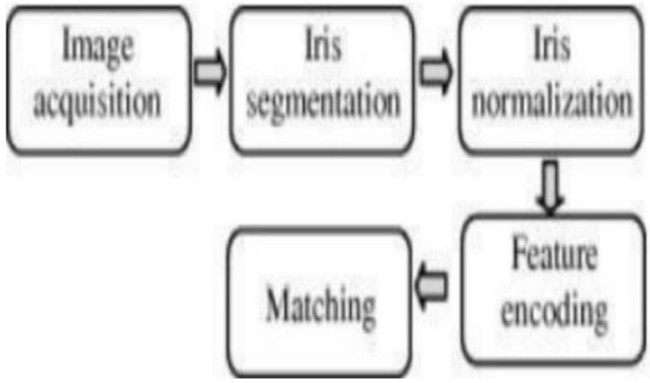

Fig.3 IRIS recognition system

B) SEGMENTATION

A good segmentation algorithm should involve two procedures: Iris localization and noise reduction. The iris localization process takes the acquired image and find both the boundary between the pupil and iris, and the boundary between the iris and the sclera.The noise reduction process refers to localizing the iris from the noise (non-iris parts) in the image. These noises include the pupil, sclera, eyelids, eyelashes.

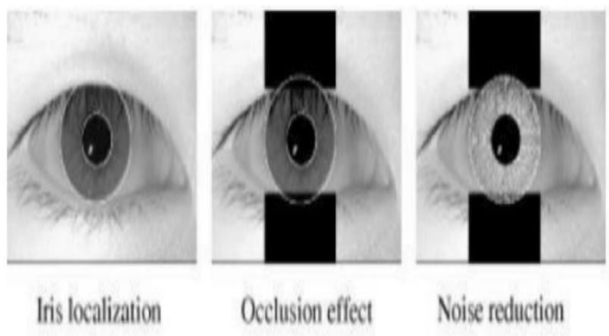

Fig.4 Segmentation

Typical iris segmentation methods include Daugman'sintegro-differential operator and edge detection using the circular Hough transform. Daugman's method,

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which is used in this work, assumes the pupillary and limbic boundaries of the eye as circles and an integro-differential operator is utilized to detect the iris boundary by searching the parameter space. The circular boundary is detected when the integro-differential operator attains its maximum.The iris boundary was described with three parameters: the radius r, and the coordinates of the center of the circle, x0 and y0. More recently, Daugman proposed alternative segmentation techniques to better model the iris boundaries taking into account that the pupillary and limbic boundaries are often not perfectly circular and the eyelids or eyelashes occlusion.

C) NORMALIZATION

Different iris images may not be all of the same size, either due to the change in distance from the camera or due to the changes in illumination which can cause the iris to dilate or contract. To compensate for the different size of each iris input image, Daugman resampled the segmented iris region to the fixed-size rectangular image by mapping the extracted iris region into a normalized coordinate system. To accomplish this normalization, every location on the iris image was defined by two coordinates (r, θ), where $0<r\leqslant 1$ and $0\leqslant\theta 360°$ regardless of the overall size of the image. This normalization assumes that the iris stretches linearly when the pupil dilates and contracts.

Although this approximation is good, it does not perfectly match the actual deformation of an iris .Below fig shows the normalized iris segmented above

Fig.5 Normalised IRIS Segmented

D) FEATURE ENCODING

In the feature encoding step, a template representing iris pattern information is created using a Gabor filter, log-Gabor filter, or zero-crossing of the wavelet transform. The differences in lighting between two different images causes error when directly comparing the pixel intensity of two different iris images. To alleviate this difficulty, Duagman extracted the features from the normalized iris image by using convolution with 2-D Gabor filters. In that system, the filters are multiplied by the raw image pixel data and integrated over their domain of support to generate coefficients which describe, extract, and encode image texture information. A noise mask associated with the feature template is generated to mark the corrupted bits in the template,

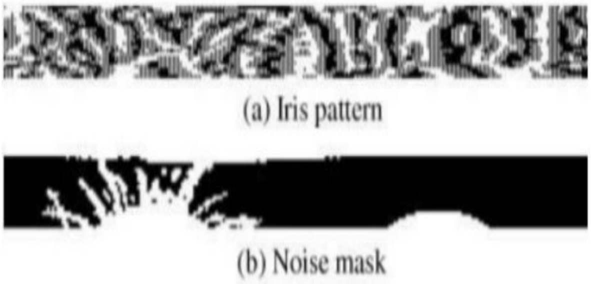

Fig.6 Figure for Feature encoding

E) MATCHING

The goal of matching is to evaluate the similarity of two iris representations. Created templates are compared using the Hamming distance or Euclidean distance. The normalized Hamming distance used by Daugman measures the fraction of bits for which two iris codes disagree. A low normalized Hamming distance implies strong similarity of the iris codes. If parts of the irises are occluded, the normalized Hamming distance is the fraction of bits that disagree in the areas that are not occluded on either image.

To account for rotation, comparison between a pair of images involves computing the normalized Hamming distance for several different orientations that correspond to circular permutations of the code in the angular coordinate. The minimum computed normalized Hamming distance is assumed to correspond to the correct alignment of the two images.

V. RESULTS

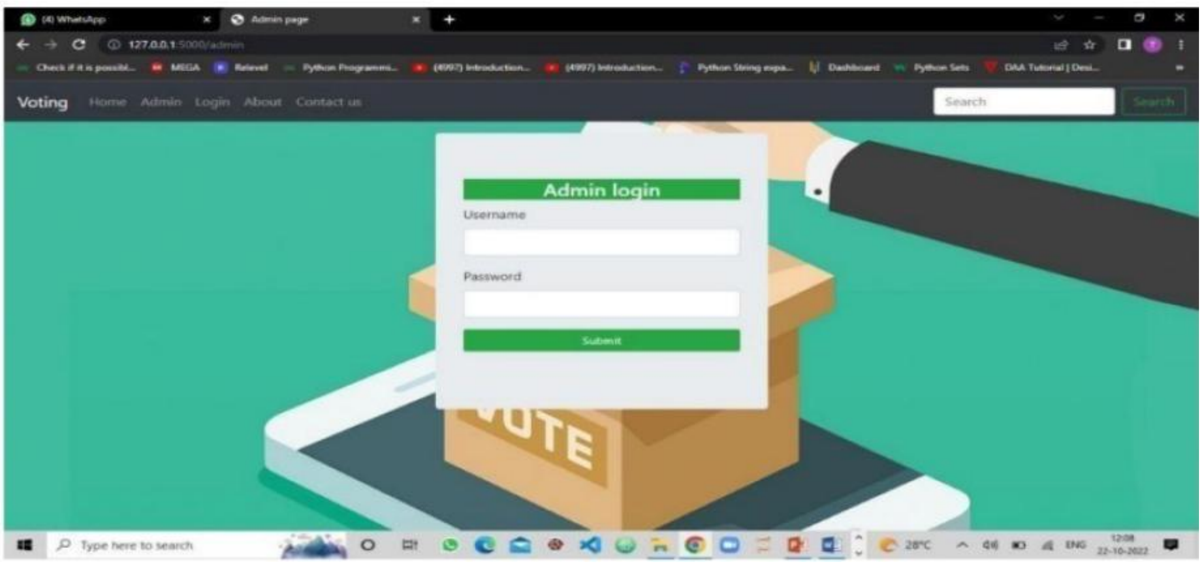

Fig.7 Admin login page

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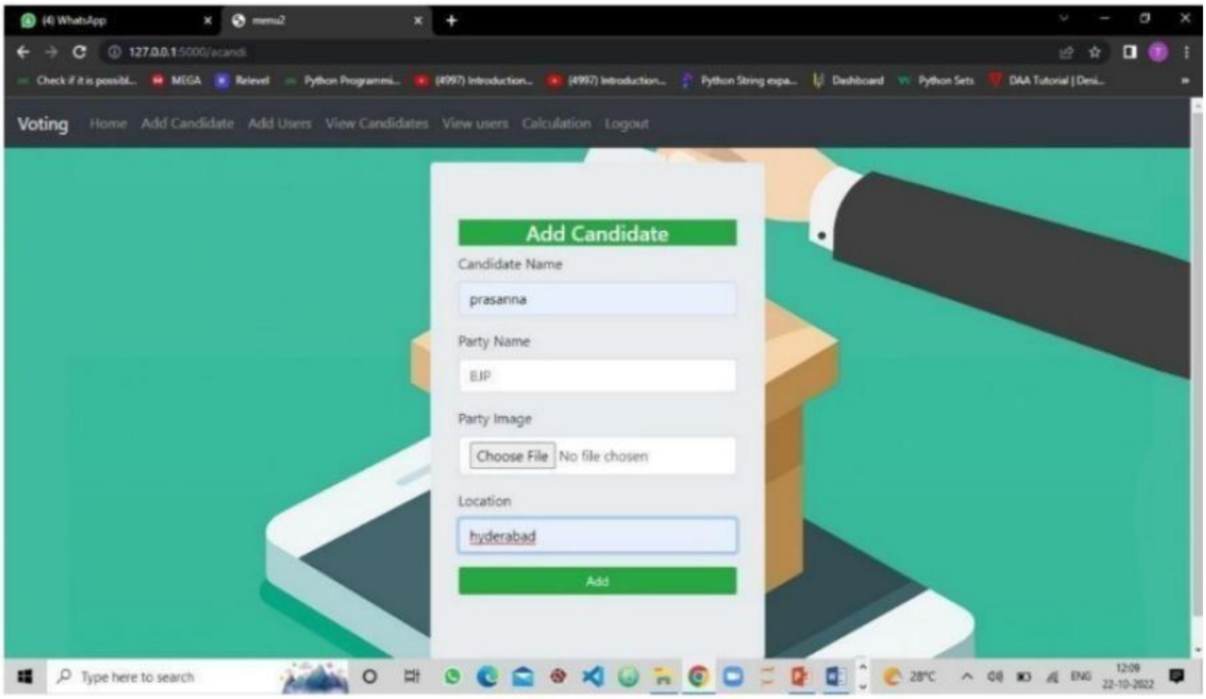

Fig.8 Admin adding Candidates to the application

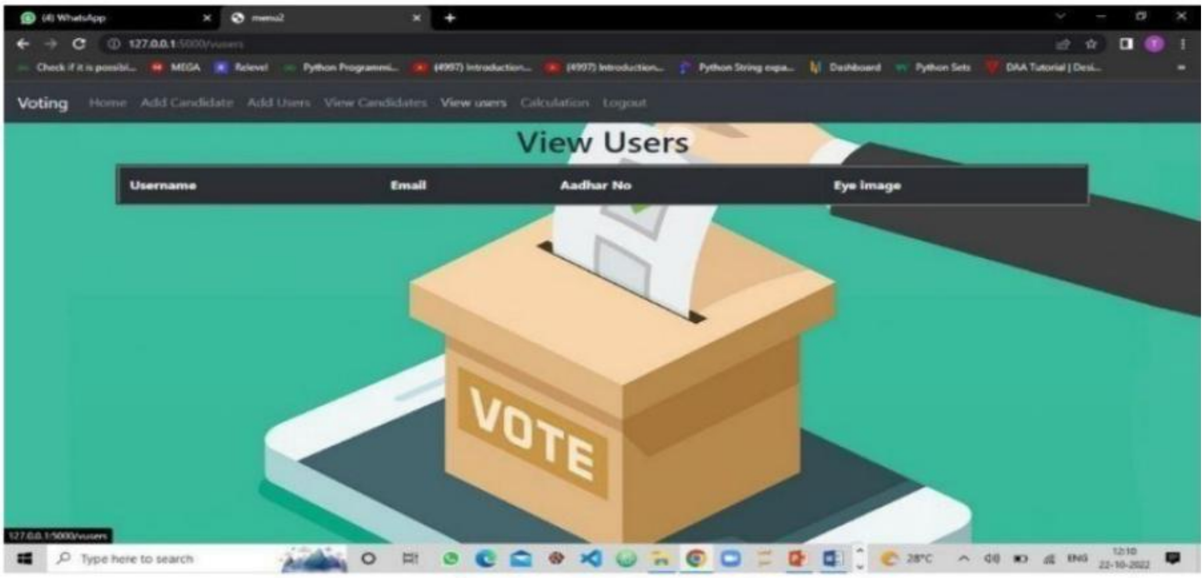

Fig. 9 Admin viewing User which are added to the Application

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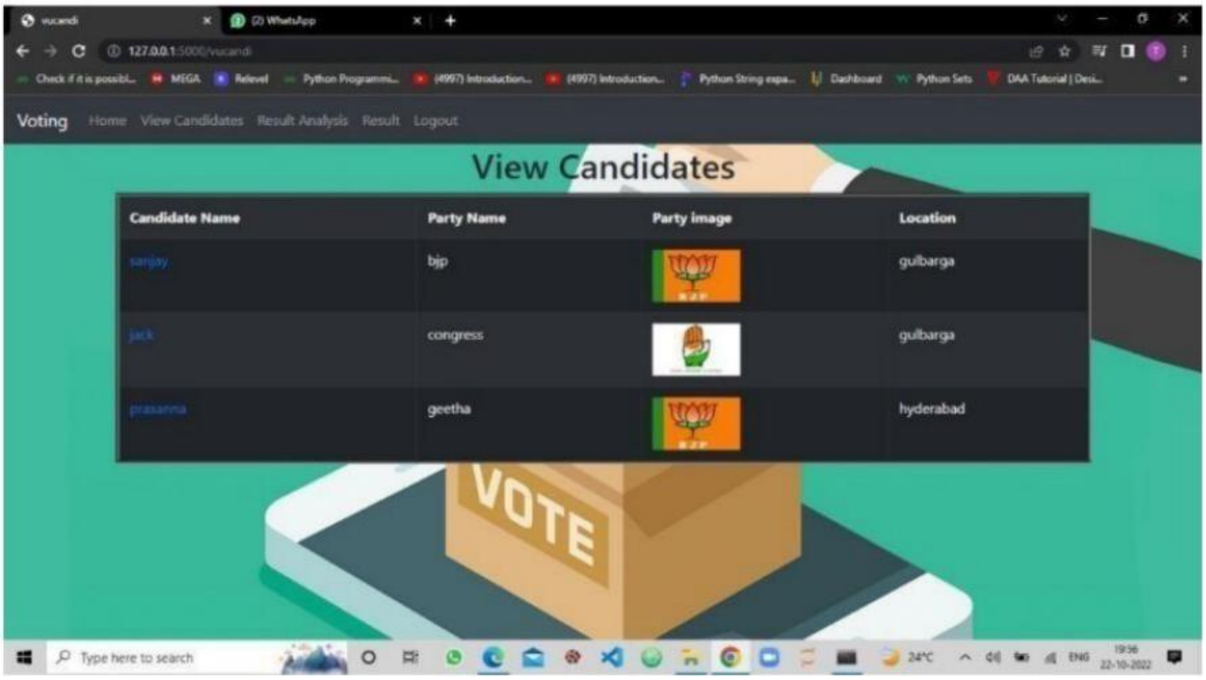

Fig.10 User viewing Candidates

Fig.11 User successfully completing voting process

Fig.12 User viewing candidates with no of votes

Fig.13 Result Analysis upto the current Voting

VI. CONCLUSION

As multiple images of the same eye may be required to improve the performance of an image recognition system, this work presents an algorithm by which a given set of base templates are fused to generate one final template for the set. An experimental work using 450 images for 45 persons from MMU1 database reveals a reduction in database size by nearly an 78% and an increase of verification speed of about 80% is achieved,while maintaining about 99.7% accuracy of matching.

The applications for the proposed protocol are not limited to government elections only. These can be stretched to opinion polls or corporate elections providing a unified platform for voting regardless of the cost or circumstance. The drive behind a cheaper, unified, electronic voting system was the basis for the above protocol, which has potential to grow into a real wide-spread implementation, dealing with assumptions and concerns which limit the current system.

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