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ONLINE VOTING USING INTEGRATED MEASURES

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***Abstract*—Intheonlinevotingsystem,peoplecanvotethrough theinternet.Inordertopreventvoterfrauds,integratedmeasures includestwolevelsofsecurity.Inthefirstlevelofsecurity,theface of the person is verified with the face present in the database and validated using Matlab. The comparison of the two faces is done using Local Binary Pattern algorithm. The scheme is based on a merging an image and assigns a value of a central pixel. These centralpixelsarelabeledeither0or1.Ifthevalueisalowerpixel, a histogram of the labels is computed and used as a descriptor. A password (OTP) is used as the second level of security, after enteringtheonetimepasswordgeneratedtotheirmailitisverified andallowtovote.Itshouldbenotedthatwiththissysteminplace, the users, in this case, shall be given an ample time during the voting period. They shall also be trained on how to vote online before the electiontime.**

***Keywords*— Online voting, Face recognition, LBP, OTP.**

I. INTRODUCTION

The election is a well-known thing in modern days of democracy.ElectroniconlinevotingovertheInternetwouldbe much more profitable. Many voters would appreciate the possibility of voting from anywhere. This paper proposes a people who have citizenship of India and whose age is above 18yearsofageandanysexcangivehis\hervoteonlinewithout going to any polling station. There is a database which is maintained in which all the names of voter's complete information isstored.

There are some basic security requirements that need to be fulfilledbyanyvotingsystem.Theseare:firstly,theanonymity of a voter's ballot must be preserved, and voters must not be abletoprovehowtheyhavevoted;secondly,thevotingsystem must be tamper-resistant to a wide range of attacks; thirdly, a votingsystemmustbeuser-friendly.Inaddition,votingprocess must be transparent and comprehensible enough so that voters and candidates can readily accept the results. In general, such online voting should satisfy such requirements asfollows:

1. Accuracy
2. Simplicity
3. Verifiability
4. Democracy
5. Privacy
6. Security

For such an online voting system, security and privacy are the main concerns. From that point of view, an implementation of the online voting system appears with face recognition and password (OTP). Our approach suggests a practicalapplication of the existing face recognition and password (OTP) that ensurestheintegrityofthevotecastbyvoterandauthentication ofthevoteratthetwolevels.Theadvantageoftheonlinevoting system is that voter can vote from anywhere through the internet. Subsequently, the result of the election is computed fromthesumofthevoteswhichhavebeenvotedbythevoters.

Deutsch [3] proposed voting system based on Punch-card and mark-sense optical scan systems as well as DRE. It does not include any biometric security. After that many secure voting systems have been proposed. Malladi*et.al.*[5] process of voting starts with the card punching and the real process of online voting through ATM terminal. It ensures duplicate vote avoidance through dual-tier authentication using One Time Password (OTP) and a Random Security Question (RSQ). Jambhulkar*et.al.*and Mursi*et.al.* [8] proposed Cryptographic schemes and a digital signature that ensures the integrity of the vote cast by voter and authentication of the voter. Malkawi*et.al.*[7], Sridharan [10] and Anandaraj*et.al.* [1] proposed e-voting system using simple biometrics for election process. [4] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management.

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- It fulfils the security requirements of a traditional voting system and brings the flexibility of the online votingsystem.
- ItcanusefacerecognitionandOTPtoauthenticatethe voters.

II. PRELIMINARIES

A. *Face Detection andRecognition*

Face detection and recognition are still a very difficult challenge and there is no unique method that provides a robust and efficient solution to all situations face processing may encounter. In some controlled conditions, face detection and recognitionarealmostsolvedoratleastpresentahighaccuracy rate but in some others applications, where the acquisition conditionsarenotcontrolled,faceanalysisstillrepresentsabig challenge.

1) FaceDetection

Face detection is a specific case of object-class detection, whichthemaintaskistofindthepositionandthesizeofobjects in an image belonging to a given class. Face detection algorithms were firstly focused on the detection of frontal human faces, but nowadays they attempt to be more general trying to solve the face multi-view detection: in-plane rotation andout-of-planerotation.However,facedetectionisstillavery difficult challenge due to the high variability in size, shape, color and texture of the human faces. Generally, face detection algorithms implement face detection as a binary pattern classification task. That means, that given an input image, it is dividedintoblocksandeachblockistransformedintoafeature.

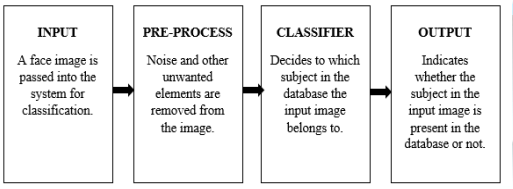

Fig. 1.Generic representation of a face recognition system.

2) FaceRecognition

Face recognition is a challenging task which receives much attention as a result of its many applications in fields such as security applications, banking, law enforcement or video indexing.Thetaskoffacerecognitioninstillimagesconsistsof identifyingpersonsinasetoftestimageswithasystemthathas beenpreviouslytrainedwithacollectionoffaceimageslabeled with each personidentity.

Face recognition can be divided into following basic applications, although the used techniques are basically the same:

- Identification: An unknown input face is to be recognized matching it against faces of different known individuals database. It is assumed that the person is in thedatabase.
- Verification: An input face claims an identity and the system must confirm or rejects it. The person is also a member of thedatabase.

B. *Password(OTP)*

A one-time password (OTP) is a password that is valid for onlyoneloginsessiononacomputersystemoranyotherdigital device. OTPs avoid a number of shortcomings that are associated with password-based authentication. The most advantagethatisaddressedbyOTPsisthat,incontrasttostatic passwords, they are not vulnerable to replay attacks. A number of OTP systems also aim to ensure that a session cannot easily be impersonated without knowledge, thus reducing the attack surfacefurther.

OTP generation typically make use of pseudo-randomness or randomness, making of successor OTPs by an attacker difficult.

III. PROPOSEDMETHODOLOGY

This section presents a description of online voting. Online votingconsistsoftwoentities:registration,onlinevotingpanel. The main purpose of this entities are: registration includes details and an image as input from the voter and stores it in a database. The online voting panel includes two: pre-processing and result.

Fig.2. describes the block diagram of the proposed system. Theinputtothesystemisintheformoftextandimage.Itstores the details of the voters with their image. Captured images are appliedtothepre-processing,featureextractionandrecognition process. Preprocessing deals with techniques for enhancing contrast, removing noise. Feature extraction is used to detect and isolate various desired portions or shapes of a digitized image. Image recognition uses an image-based approach towardsartificialintelligencebyremovingredundantdatafrom face images through image compression using the two-dimensional discrete cosine transform (2D-DCT). The DCT extracts feature from face images based on skin color. OTP generation typically make use of pseudo-randomness or randomness,makingofsuccessorOTPsbyanattackerdifficult. Thevotingprocesswillbedoneandtheresultsarestored.OTPs avoid a number of shortcomings that are associated with

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password-based authentication. Fig.3. explains about the flow of the online voting system.

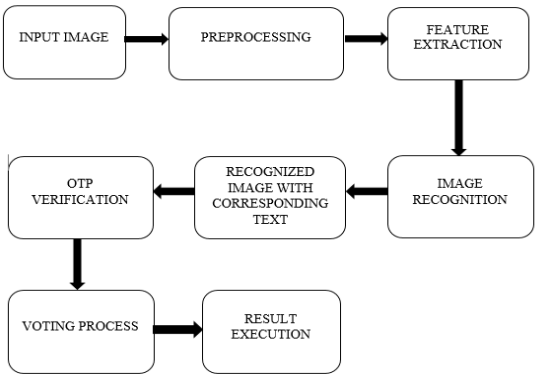

Fig. 2. Block Diagram of Proposed System

A. *Local Binary Patterns*

This operator works with the eight neighbors of a pixel, using the value of this center pixel as a threshold. If a neighbor pixel has a higher gray value than the center pixel then it is assigned as one to that pixel, else it gets a zero. The LBP code for the center pixel is then produced by concatenating the eight ones or zeros to a binary code. A face image is first split into small regions that LBP histograms are extracted and then concatenated into a single feature vector. This vector forms an efficient representation of the face area and can be used to measure the similarities between images.

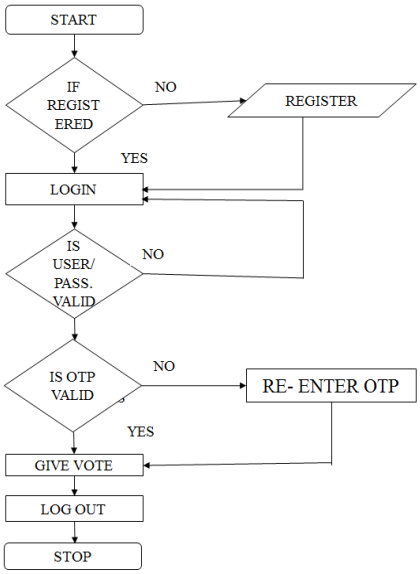

Fig .3. Flow diagram of proposed system

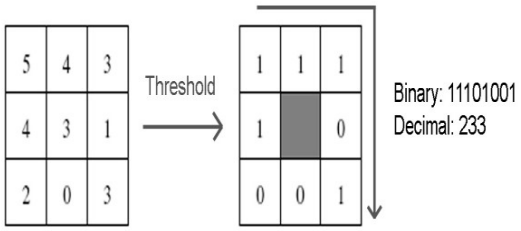

Fig.4. Original LBP Operator

C. *Figures*

The result explains about the online voting in step by step process. Fig.5. includes general information like name, age, sex, date of birth and e-mail ID. It is used to store the database of a voter and mail ID is collected to send an OTP to verify the registered person. Fig.6 describes about matching of the online voting of the voter from the database. Fig.7. describes about matchingtheOTPgeneratedtotheircorrespondingmail.Fig.8. describes about the generation of symbols. Fig.9. describes about the complete panel which indicates the result of the voting process with winner's totalcount.

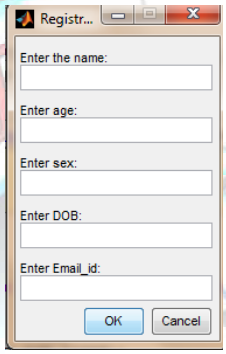

Fig.5. Registration Process

Fig.6. Matching the voter from database

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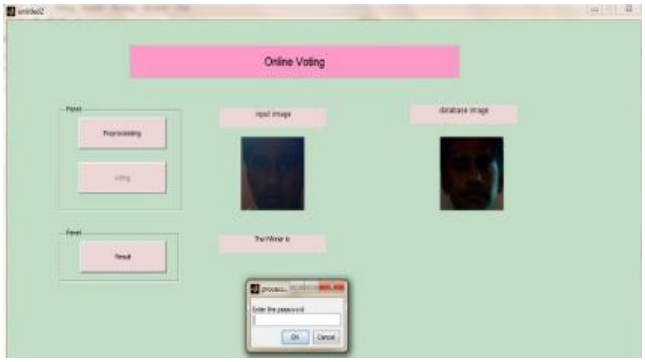

Fig.7. Generation of OTP matching

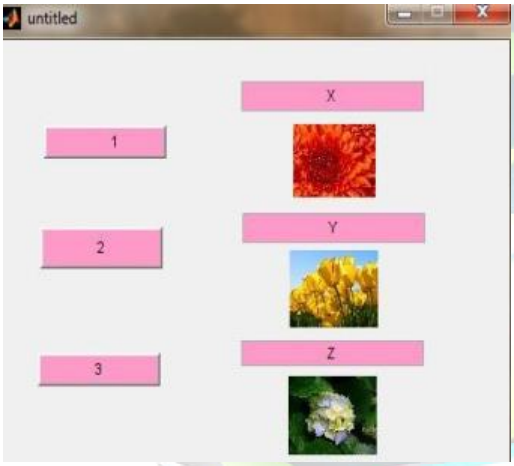

Fig.8. Symbols of the party's

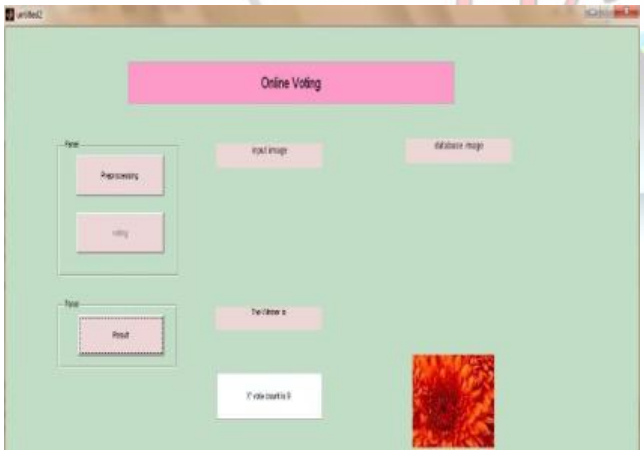

Fig.9. Final Result Execution

IV. CONCLUSION

This online voting system will manage the voter's information by which the voter can login and use his voting rights. The system will incorporate all features of the voting system. It provides the tools for maintaining and counting the total number of votes of every party. There is a database which is maintained in which all the names of a voter with complete information is stored.Voting detail is stored in the database and the result is displayed by the calculation. By online voting system percentage of voting is increases. It decreases the cost and time of the voting process. It is very easy to use and it is very less time consuming. Persons who have an internet connection at home with a web camera can vote without taking the strain to come to the voting booth. In future, the same system can be extended to include an administrator mode in which the user details can be updated dynamically through the application only. To improve the security level the face vein is can be matched. In near future, we can even implement the system in mobile phones. The user can access the website through mobile phone and cast thevote.

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