ONLINE VOTING SYSTEM USING FACE DETECTION BASED ON OTP

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Abstract — To achieve higher level of security, two levels of authentication techniques are used. First authentication technique used is a Face Detection and Recognition system. In this method of authentication, the voters face image captured during the registration is compared with the image captured by the webcam at the time of casting vote. Second level authentication is done using One Time Password (OTP) principle. After the first level of authentication is done, a pseudo random number is generated using the OTP principle that is used by the voter while casting the vote. These techniques provide a more secure platform thus overcoming vulnerabilities of the traditional voting system.

I. INTRODUCTION

The online voting system where a person can cast his vote from anywhere in the world by logging onto a website is being adopted by an increasing number of governments and companies. Online voting system has the facility to complete voting process faster than the Electronic Voting Machines (EVM). This system itself should be intelligent to earn the trust and confidence of the user by providing enhanced security and reliability. The security is an important factor in any voting system. Elections are the foundation of any democracy as the true spirit of democracy lies in people choosing their own government. But, the way elections are conducted right now in our country has defects and loopholes which are being used to advantage by contestants and political parties. The current system has a lot of loopholes like the possibility of duplicate votes, rigging EVMs, faking the count, all of which tamper the true meaning of democracy. Moreover, the election conducting body, Election commission of India (ECI) uses Electronic machines for conducting elections in most of the places which is quite time-consuming, energy-consuming and should be done at an assigned place which is not comfortable to all. The EVMs have to be checked, transported, monitored with more human power and is an expense.

I. LITERATURE SURVEY

A. Iris Detection in Voting System

In this paper, the author focuses on the Iris Detection of the voters. Voter’s Iris is detected and once it matches, the system confirms the voter to be the eligible individual to vote by checking his/her Aadhar details. Once confirmed the voter will be allowed to cast the vote.[1] As the existing Aadhar database contains all the information about voter’s Iris, fingerprints and other details like address, blood-group voter can be easily tracked and checked. This approach requires less manpower and highly secure.

B. Voting System using OTP

The author focuses on OTP data of the voters to recognize the authentic voters. Once the OTP is confirmed the information will be sent to the web application through the microcontroller’s serial port. After matching the OTP is confirm with the existing image in the database the server sends the message and displays it on the LCD confirming the owner’s identity. If not confirmed, it displays the same as not eligible through LCD.

C. Smart Voting

The proposed system in the paper has 3 security phases. Information of individuals above age 18 will be taken from the Aadhar database. In the first phase, the voters will be given an Id and password through the registered e-mail Id before the voting process. The second phase is validating the voter using otp data and once confirmed voter will be allowed to cast the vote. After casting, as a part of the third phase, the voter Id will be deleted leaving no second chance to vote again. Aadhar details that were used by the voter will be locked to track the voter for further access. The count will be updated.
parallel.

D. Location-free Voting System with the help of IoT Technology

In the paper voting process is done through the smartphone using its OTP. The OTP number of the phone will be linked to an application in the Smartphone to validate the voter and voter will be allowed to vote only on the day of the scheduled process. The voter can vote from anywhere and will be allowed to vote only once.

E. Secure Reliable Face Recognition

The author focuses on the facial feature extraction using component-based face detector. Once all the features are extracted they are compressed to a single feature vector and it is fed to the recognizer. The whole process is implemented using MATLAB. The same is done with the OTP number. Every number of OTP is analyzed whereas for facial images the distance between the facial marks or features is analyzed. The analysis is called principal component analysis. This approach helps to build a better version of the existing system.

II. EXISTING SYSTEM

Currently, voting systems are Electronic Voting Machines (EVM) and Secret Ballet Voting which require man-power and are time-consuming processes. Individuals above age 18 are eligible to vote. Voter’s Id and others details are validated manually and only after confirmation he/she will be allowed to vote. The EVMs have to be checked and transported to different parts of the country wherever the election is taking place. It also needs human power and security. The counting of the votes casted in EVMs also needs manpower and takes an entire day and ballet voting is entirely manual. So, there are a lot of ways the counting and the voting to be clean. Hence the current system can be made a lot better, more accessible and more efficient.

I. PROPOSED SYSTEM

The designed and proposed smart voting system uses face recognition using image processing which is more secure than the already existing one. The main security level is where the system recognizes the face of the voter from the current database of face images given by the election commission. If the image captured matches the respective image of the voter in the database, then a voter can cast their vote in the election. Haar Cascade Algorithm is used to extract the facial features and to recognize the facial part of the image. Visual Studio and software like Python, HTML, and CSS were used to create the online platform and to implement the algorithm.

II. METHODOLOGY

This proposed concept is an entirely web-based system so the basic features related are web-based technologies such as database creation, image processing properties which determine the software requirement of the system. This application will be available online on authorized government sites, whenever or whichever day authorized. The voters will be able to cast their votes by use of this website. Eligible voters will be validated by facial recognition. The voter will open the website on the day of elections. The server will be run as to whenever the Election Commission authorizes. The voters can open the website with the link or the IP address provide. For example, the website we created has the IP address as http://127.0.0.1:8000/. Once you open the website and click on the vote button, the voter’s face will be captured with the help of whatever device they are using the website from like a laptop, PC or their mobile camera. The captured image will then be received by the server. The server goes through all the images in the database and tries to find a match in the registered ones. If a matching face is found, the voter is registered and recognized by the election commission and hence is allowed to vote. If a match is not found, the page will say he or she is not recognized and would not be allowed to vote. The picture matched will be displayed along with their ID numbers and then be lead to the voting page where he or she can vote to any political party they prefer from the list of options displayed. Once they click on their preferred party, the choice cannot be changed and the rest of the options will be disabled as well. The server accepts the votes cast by the authenticated voters and stores them. The count of how many votes each political party’s candidates will be stored as well. This way even the counting of votes is very easy and the commission or the candidates or the voters do not have to wait for days to know the results.

III. FACE DETECTION

The problem of face recognition is all about face detection. This is a fact that seems quite bizarre to new researchers in this area. However, before face recognition is possible, one must be able to reliably find a face and its landmarks. This is essentially a segmentation problem and in practical systems, most of the effort goes into solving this task. In fact the actual recognition based on features extracted from these facial landmarks is only a minor last.

There are two types of face detection problems:

- Face detection in images
- Real-time face detection

I. FACE DETECTION IN IMAGES

![Figure 1. A successful face detection in an image with a frontal view of a human face.](image-url)
Most face detection systems attempt to extract a fraction of the whole face, thereby eliminating most of the background and other areas of an individual's head such as hair that are not necessary for the face recognition task. With static images, this is often done by running a across the image. The face detection system then judges if a face is present inside the window (Brunelli and Poggio, 1993). Unfortunately, with static images there is a very large search space of possible locations of a face in an image.

IV FACE DETECTION PROCESS

It is process of identifying different parts of human faces like eyes, nose, mouth, etc... this process can be achieved by using MATLAB code. In this project the author will attempt to detect faces in still images by using image invariants. To do this it would be useful to study the grey-scale intensity distribution of an average human face. The following 'average human face' was constructed from a sample of 30 frontal view human faces, of which 12 were from females and 18 from males. A suitably scaled colormap has been used to highlight grey-scale intensity differences.

The grey-scale differences, which are invariant across all the sample faces are strikingly apparent. The eye-eyebrow area seem to always contain dark intensity (low) gray-levels while nose forehead and cheeks contain bright intensity (high) grey-levels. After a great deal of experimentation, the researcher found that the following areas of the human face were suitable for a face detection system based on image invariants and a deformable template.

V. FACE RECOGNITION

This technique involves computation of a set of geometrical features such as nose width and length, mouth position and chin shape, etc. from the picture of the face we want to recognize. This set of features is then matched with the features of known individuals. A suitable metric such as Euclidean distance (finding the closest vector) can be used to find the closest match. Most pioneering work in face recognition was done using geometric features (Kanade, 1973), although Craw et al. (1987) did relatively recent work in this area.

I. Face recognition using template matching

This is similar the template matching technique used in face detection, except here we are not trying to classify an image as a 'face' or 'non-face' but are trying to recognize a face.

The simple technique of comparing grey-scale intensity values for face recognition was used by Baron (1981). However there are far more sophisticated methods of template matching for face recognition. These involve extensive pre-processing and transformation of the extracted grey-level intensity values. For example, Turk and Pentland (1991a) used Principal Component Analysis, sometimes known as the eigenfaces approach, to pre-process the gray-levels and Wiskott et al. (1997) used Elastic Graphs encoded using Gabor filters to pre-process the extracted regions. An investigation of geometrical features versus template matching for face recognition by Brunelli and Poggio (1993) came to the conclusion that although a feature based strategy may offer higher recognition speed and smaller memory requirements, template based techniques offer superior recognition accuracy.
I. Home Page

II. Register Page

III. Vote Page

IV. Candidate List

V. Admin Page

VI. RESULTS
VI. Election Result

VI. ACKNOWLEDGMENTS

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VII. CONCLUSION

In total, this system overcomes most of the problems faced during the voting period by the paper ballot system and EVM. This will surely ensure a safer voting method which is very much what is required for a healthy growth of a developing nation. The proposed Fingerprint and Face Recognition based voting system which is better and faster than previous systems. The new system prevents access to illegal voters, provides ease of use, transparency and maintains integrity of the voting process.

VIII. REFERENCES


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