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Face Detection Based Voting System Using OPENCV

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ABSTRACT: In this concept, the system is using most advanced and secure way of e-voting. In this, system actually use two steps for verification of the voters during the voting session, one is RFID data verification of voters and followed by successful face authentication will allow the voters to vote for their desired candidate using Haar Cascade Algorithm. These two authentication process will definitely reduce the piracy issues of voters and counterfeit vote. In India, there are two types of voting in practice. They are secret Ballot paper and Electronic Voting Machines (EVM), but both of the process has some limitation or demerits. The current voting system is not secure and time consuming as well. The people who are not eligible to vote can also cast their votes by unwanted means, which may cause various problems. In India, Computerized voting system has not yet been implemented. So, initiating this system we are proposing a way for voting which will be more effective. Here we have two level of security in voting process. The first level is the verification of RFID number and second level is face recognition. The security level of our system has been highly improved by the use of new method for each voter. The authentication of the user in the system is improved by using face recognition in the application, which will be able to identify whether the user is authenticated user or not.

KEYWORDS: -Intelligent surveillance, IMAP, Protocol, Potential threat

I. INTRODUCTION

Electronic voting machine has already been developed and widely used in many developed countries. But during the election time, verification process takes a lot more time and there is possible to occur counterfeit vote. In India, they are using two types of method for voting. The first method is secret ballot paper, in which many papers are used and second method is EVM (electronic voting machine) which is in use since 2003. We need to propose a computerised voting system which is more secure than the existing one. In this, face recognition is used which will be used to detect the right person that is stored in database. In our proposed system, we are using two types of verification for voters. The first one is RFID number verification, if your election commission id number is correct in RFID Data Verification then you have to go for Second level of security which is the main security level where the system recognize the face of the real voter from the current database of face images given by the election commission which is already connected with RFID. Finally, the images taken is matched with the images stored in the database, then the voters can cast their voting in the election. As you know that in the existing system there is no much secure in voting because here the only source of security level is the voter id which can easily be accessed by the other person by getting their voter id card. By keeping this in mind we are proposing new level of security which is much more secure than the existing system.

II. OBJECTIVE

In this concept, the system is using most advanced and secure way of e-voting. In this, system actually use two steps for verification of the voters during the voting session, one is RFID data verification of voters and followed by successful face authentication will allow the voters to vote for their desired candidate using Haar Cascade Algorithm. In India, there are two types of voting in practice. They are secret Ballot paper and Electronic Voting Machines (EVM), but both of the process has some limitation or demerits. The current voting system is not secure and time consuming as well. The people who are not eligible to vote can also cast their votes by unwanted means, which may cause various problems. In India, Computerized voting system has not yet been implemented.



Fig:1

III. METHODOLOGY

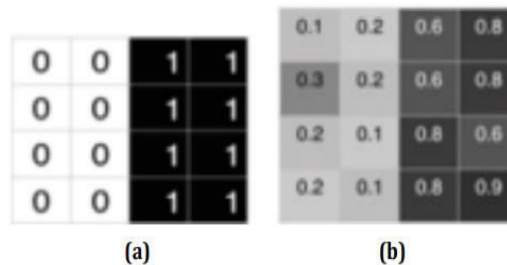
The designed and proposed smart voting system uses face and Fingerprint recognition by using the image processing and Minutiae based Matching method. which is more secured than the existing one. The main security level is where the system recognizes the face and fingerprint of the voter from the current database of face images and Fingerprint 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. Minutiae based Matching method is for matching fingerprint images and image given by election commission. If the image captured is matched and voter is allow to vote. 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 mission or the candidates or the voters

IV. FACE DETECTION USING HAAR CASCADE

Face detection, which is the major part of this project is done by using the Haar Cascade method which is a machine learning object detection algorithm used to identify objects in an image or video. The algorithm is trained to detect a face by using a lot of positive and negative images. Firstly, the picture is converted into a grey-scale, and then it detects Haar features-sequence of square-shaped functions. Then it uses classifiers to detect the face (1) and not a face (0). This face detection happens in four stages. The first being, detection of Haar features, second being, using integral images, third stage is Adaboost and fourth is the cascade of classifiers.

V. DETECTING HAAR FEATURES

Before Haar features, image pixel intensities were used for face detection which is a lot of effort and work, therefore Paul Viola and Michael Jones used Haar wavelets which detect faces taking smaller subsections of a face at once into consideration compute sum of their pixel intensities and then find the difference between these sums. This is further explained in detail below. For black and white image pixel values are 0 or 1 (ideal case) but in real cases, we have normalized greyscale image as shown in the bottom box containing pixel values which are usually between 0 and 1.



According to the Viola-Jonas algorithm, to detect Haar-like features present in an image, below formula should give a result closer to 1. The closer the value is to 1, the greater the change of detecting Haar feature in the image. (1) $\sum () \sum ()$ (2) Ideal case: $\Delta = (1/8)*(8) - (1/8)*0 = 1$ Real case: $\Delta = (1/8)*(5.9) - (1/8)*(1.3)=0.575$ Haar features are very effective in detecting rectangle-like features, thereby making it a very functional face detection technique. For example, the figure 3(b) below can be an eye. The darker region being the eye and the lighter region corresponding to the cheek part of the face. As eyes are the darkest parts of the face compared to the rest of the face usually in the grey scale images or otherwise, they are detected first. Another example is figure 3(a) could be the nose as the bridge of nose is usually elevated and is darker than the cheek part of the face. This is how Haar features that are good at detecting lines and edges detect the face or subsections of the face first.

VI.FINGERPRINTS RECOGNITION USING MINUTIAE BASED METHOD

Fingerprints of voter can taken by sensor and stored in the sever database. Input fingerprint is compared by the fingerprint given by the election commission. Fingerprint recognition can be a verification of Fingerprint. The vote of a person verification using his fingerprint. Minutia Points and Matching of Fingerprint. Machine learning is differ From Deep Learning. Machine is taken long time to training ,But Deep Learning is finite duration and less than machine Learning.

VII. CONCLUSIONS

As we see that existing voting system has many defects such as lengthy process, time taking, not secure, bogus voting, no security level but now we can say that our approach is more useful and secure from the existing system. Since, we are using three level of security in this proposed system the false voters can be easily identified. The facial authentication technique is very much useful in identifying the fraud voters, so we can avoid the bogus votes during election commission. As every operation is performed through internet connectivity so, it is onetime investment for government. As data is stored in centralized repository so, data is accessible at any time as well as backup of the data is possible. Smart voting system provides updated result at each and every minute. Also requires less man power and resources. The database needs to be updated every year or before election so that new eligible citizens may be enrolled and those who are dead are removed from the voter list. But among all these features we calculated, most of them are irrelevant. For example, consider the image below. Top row shows two good features. The first feature selected seems to focus on the property that the region of the eyes is one darker than the region of the nose and cheeks.

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