IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

SMART VOTING THROUGH FACE RECOGNITION

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Abstract: Face recognition is a class of biometric security which works by coordinating the facial features. It assists with making sure about the voter, by utilizing the face recognition strategy. In this proposed system, Haar Cascade algorithm is utilized for face recognition which utilizes Haar-Like features to coordinate the face. Haar Cascade is an object detection algorithm. In this proposed system there are three degrees of confirmations. The first is user id confirmation and second is for the voter card number. In the event if the voter passed the two degrees of confirmation, at that point he/she enters to next degree of checks. The third degree of confirmation incorporates the utilization of face recognition. This is the fundamental security level to confirm the voter is legitimate or not.

Index Terms **- Haar-Like features, Object detection, Face recognition, Biometric security, Rectangular frame.**

I. INTRODUCTION

Majority rule government will be governed by the individuals in which the practiced legitimately by them or by their chosen representative under a free discretionary. In an immediate vote based system, all residents, without the delegate of chosen or named authorities, can take an interest in settling on open choices. The word vote based system regularly alludes to a type of government wherein individuals pick pioneers by casting a ballot. Casting a ballot is a strategy for a gathering, for example, a gathering or an electorate, so as to settle on an aggregate choice or express a conclusion about the candidates from different parties.

Election is the procedure through which individuals can communicate their political sentiment. They express this conclusion by open democratic to pick a political pioneer. Besides, this political pioneer would have authority and duty. Generally important, Election is a conventional cooperative choice creation procedure. Additionally, the chosen political pioneer would hold open office. The political race is positively an imperative mainstay of majority rules system. This is on the grounds that; Election guarantees that the administration is of the individuals, by the individuals, and for the individuals. Constituent frameworks are point by point protected plans and casting ballot frameworks. These point by point established plans and casting ballot frameworks convert the vote into a political choice.

At present in India two kinds of strategy are utilized for casting a vote. The main technique is secret ballot paper, in which heaps of papers are utilized and second strategy is EVM [1]. The proposed strategy for voting is more secure than the current methods. In this proposed venture face detection idea is utilized to recognize the specific individual. There are three degrees of checks were utilized for the voters in the proposed framework.

The present election methods aren't secure and tedious too. The voters need to go to conveyed places like surveying corners and remain in a long line to make their choice, because of these reasons the majority of the individuals passes up on the opportunity of throwing their votes. The individuals who are not qualified to cast a ballot can likewise cast their votes by undesirable methods, which may cause different issues. That is the reason in this idea there is a need to propose a system for casting a vote which is secure and reliable. There will be three degree of security in casting a vote procedure. The primary level is the confirmation of user id number (UID), second level is the check of voter id number (EID) and third level is face acknowledgment. The security level of the framework has been exceptionally improved by the utilization of new strategy for every voter. The validation of the client in the framework is improved by utilizing face acknowledgment in the application, which will have the option to distinguish whether the client is verified client or not. Cameras are indispensable piece of security, used to procure data from condition [2].

II. RELATED WORK

Several authors have put in efforts in the field of face recognition, significant contribution are briefed in the literature review. Vigorous technique [3] for naturally coordinating highlights in pictures comparing to the equivalent physical point on an item observed from two discretionary perspectives. Unlike conventional stereo matching approaches coordinating methodologies, the presumption like no earlier information about the relative camera positions and directions. Actually in this application this is the data wish to decide from the picture feature matches. Highlights are distinguished in two or more pictures and portrayed utilizing affine texture invariants. The fundamental test is the way to improve the recognition performance when influenced by the fluctuation of non-linear effects that incorporate illumination variances, poses, facial expressions, occlusions and so on. A robust 4-layer Convolutional Neural Network (CNN) [4], engineering is proposed for the face acknowledgment issue, with an answer that is equipped for dealing with facial pictures that contain occlusions, poses, facial expressions. There are many face recognition algorithms, just a bunch of them meet the continuous limitations of a software based arrangement without utilizing any committed hardware engine. This paper presents a real-time and robust solution for mobile platforms [5], which in general have limited computation and memory resources as compared to PC platforms. This solution includes joining two previous real-time implementations for mobile platforms to address the shortcoming of each implementation. The main execution gives an on the web or on-the-fly light source adjustment for the second usage which is seen as robust to various face postures or orientations. Pattern classification approach by considering every pixel in a image as a coordinate in a high-dimensional space is discussed in [6]. Along with the upside of the perception that the images of a specific face, under fluctuating illumination but fixed pose, lie in a 3D linear subspace of the high dimensional image space—if the face is a Lambertian surface without shadowing. In any case, since faces are not genuinely Lambertian surfaces and in fact produce self-shadowing; images will go deviate from this linear subspace. As opposed to explicitly projecting this deviation, linearly project the image into a subspace in a way which limits those regions of the face with huge deviation. Design and execution of the component extraction strategy for Speeded-Up Robust Features (SURF) and Support Vector Machine (SVM) grouping technique into the traffic signs recognition application is deliberated in [7]. The yield of this application is the importance of the traffic sign with two languages, Indonesia and English. In the SURF strategy, the littlest huge number of key focuses will influence the accuracy level to perceive a picture. Face detection is the premises of all the face processing system, while in video the face detection issue has more special importance. By examining the face detection dependent on Adaboost algorithm, this paper presents a quick and good robust face detection method. Firstly, the motion region which contains faces is obtained based on motion detection, excluding the background interference. Secondly, Adaboost algorithm is used to detect the face in the motion region and locate the face. The experiments show that this method can rapidly and accurately detect human faces [8]. The face recognition and tracking and the advancement of the customer side of system uses Android cell phones. For the face recognition stage, Viola-Jones algorithm is used that isn't influenced by illuminations. The face tracking stage depends on Optical Flow algorithm. Optical Flow is implemented in the framework with two component extraction strategies, Fast Corner Features and Regular Features [9]. Real-time robust technique is created to distinguish irises on faces with coronal axis rotation within the normal range. The technique permits head movement without any limitations to the background. The technique depends on anthropometric templates applied to recognize the face and eyes. The template uses key features of the face, for example, elliptical shape, and location of the eyebrows, nose, and lips [10].

III. PROPOSED METHODOLOGY

The proposed system at the basic level collects all the data from the candidate who is trying to register to the system. Once the user is registered it allows entering to the next stage of verifications. The user needs to verify the voter card number and the user id with details.

Once all the necessary information is gathered and compared with the existing data in the database the system will send the user to the face recognition, which is the main security level in the system. After crossing all the security level, system will allow to cast the vote to the interested government party.

When all the essential data is accumulated and compared with the current information in the database the system will send the client to the face recognition, which is the principle security level in the framework. After crossing all the security level, system will permit to cast the vote to the interested government party.

For the face recognition Haar Cascade algorithm is used. In Haar Cascade algorithm the rectangular Haar features will be generated to detect various parts like white and black portions of a gray scale image. A rectangular frame will be produced as a border that helps to crop the face alone from the entire image. It is suitable to detect multiple faces in a given image. It is already mentioned that the preprocessing step converts the RGB image to gray scale image. The pixels which were black were stored, and they were subtracted from the total number of white pixels. The output was compared with a threshold and if the features are matched, then the objective like face will be detected.

Haar-like features can be defined as the difference of the sum of pixels of areas inside a rectangle, which can be at any position and scale within the original image. Hence, by trying to match each feature at different scales in the database with different positions in the original image the existence or absence of certain characteristics at the image position can be obtained. These characteristics can be for example edges or changes in textures. Hence, when applying a set of Haar-like features pre-trained to match certain characteristics of facial features, the correlation by which a certain feature matches an image feature can tell something about the existence or non-existence of certain facial characteristics at a certain position.

Haar-features behave as a funnel called the Haar Cascade. Classifiers at the top of the cascade are very fast and their false negative rate is very low. They discard regions of an image that does not contain any face. The features become more complex further down the cascade and images are rejected immediately if the features do not resemble a face. The integral of a grayscale image is calculated by the cumulative sum of a corresponding input pixel with all pixels above and to the left of the input pixel. Thus, calculation of average intensity of any rectangular portion of an image will be calculated with the help of only 4 pixels at a time.

The algorithm has three stages:

Stage 1: Haar Feature Selection- Haar features are calculated in the subsections of the input image. The difference between the sum of pixel intensities of adjacent rectangular regions is calculated to differentiate the subsections of the image. A large number of Haar-like features are required for getting facial features.

Stage 2: Creating an Integral Image- Too much computation will be done when operations are performed on all pixels, so an integral image is used that reduce the computation to only four pixels. This makes the algorithm quite fast.

Stage 3: Cascading Classifiers-Using the relevant features to classify a face from a non-face but algorithm provides another improvement using the concept of cascades of classifiers. Every region of the image is not a facial region so it is not useful to apply all the features on all the regions of the image. Instead of using all the features at a time, group the features into different stages of the classifier. Apply each stage one-by-one to find a facial region. If on any stage the classifier fails, that region will be discarded from further iterations. Only the facial region will pass all the stages of the classifier.

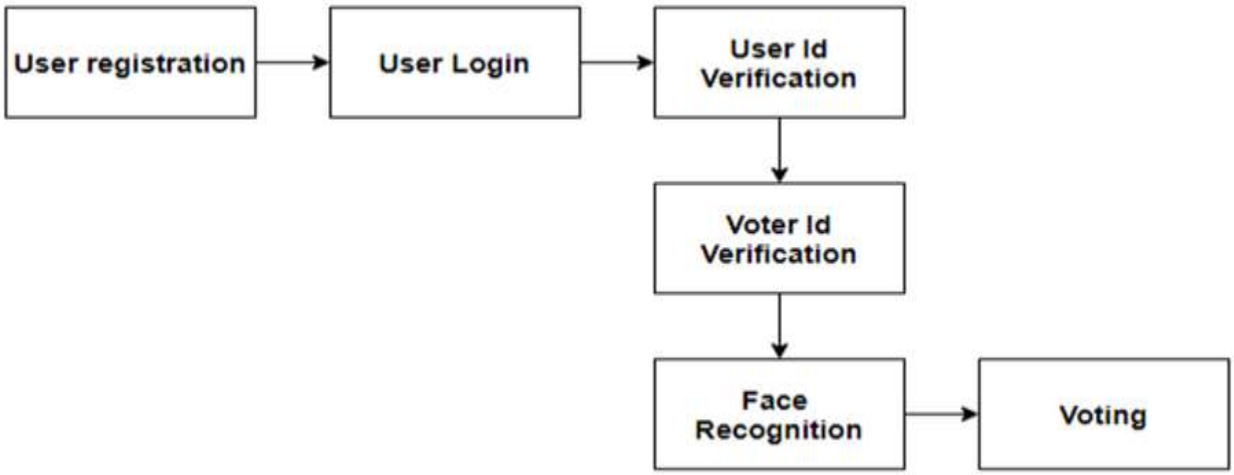

Fig 3.1: Block diagram for Smart Voting through Face Recognition System

Figure 3.1 shows the entire flow of the proposed system from collecting the data from various platforms then storing them in the database and then finally used for the verification purpose.

In the proposed framework, there are three degrees of confirmation which is viable in reducing the false voting situations.
Step I: It incorporates the user id created at the registration. User need to fill all the fields in registration page with valid details. The used id and password created at registration phase will be used in the first level of verification. If both user id and password entered is correct, system will allows user to enter to the next level of verification.

Step II: The second degree of security uses voter id that is offered by the Election Commission where it will be cross-checked by the official and now the new level of confirmation through which the voter needs to go, will incredibly improve the security. If the voter id entered by voter matches with existing details in the database then only the voter will be allowed to enter to the next level conformation

Step III: Here will be coordinating the current facial features of voter with the one present in database, this would diminish the chances of false voting and make the framework more secure and precise. In the proposed framework, the algorithm will be utilized in the field of facial recognition and also estimate the precision of the algorithm by practically implementing it and evaluating it on the test set.

Step IV: The final phase of election process, in which only the authenticated voter can cast the vote. After crossing all the security level the voter will cast the vote to interested parties. As the result the count of vote will be increased.

IV. CHALLENGES

This section discusses possible challenges or blockers that can occur while making the smart voting system. Extracting relevant information while registration, from various groups of people be challenging, hence having a clear idea of what data is needed is necessary. Collecting the data and building a consolidated view is a troublesome task, it is important to bind accurate data. Information such as voter card number will change in case the voter lost his voter id, it is important to have a database that handles real-time data.

V. RESULT

This section shows how the data is collected and how the data is compared and what the result was if data does not match.

Fig 5.1(a): Registration Successful

Fig 5.1(b): Registration with invalid details

Figure 5.2 shows the status of verification of voter id, if the voter id is verified is showing the message Voter id is verified 5.2(a) otherwise it will shows message that invalid voter id or password 5.2(b)

Fig 5.3(a): Face Detection

Fig 5.3(b): Completion of voting

Figure 5.3 shows the status of voting process. If the voter is valid is showing the details of the voter 5.3(a) and after casting vote its showing the message Thank you for voting5.3 (b)

VI. CONCLUSION

Face recognition has been since its coming a progressively secure and reliable type of confirmation by including this feature the proposed voting system, could improve the capacities of the framework and can make it more secure and liberated from bogus voting. In this paper provided one algorithm that is Haar Cascade, used to compare the faces and it is dependent on Haar features. The Face detection technique assists with expanding security and recognizing unauthenticated voter. The proposed framework is efficient by staying away from manual works and progressively secure through face detection.

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