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Smart Online Voting System through Facial Recognition Using Haar Casecade Algorithm

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Abstract: The biometric software category known as facial recognition operates by comparing the face features. We will research how different algorithms are implemented in the field of secure voting procedures. Three layers of verification were applied for the voters under the system we propose. UID verification comes first,and voter cards come second. usage of several algorithms for number, and the third level of verification includesface identification utilising the algorithm of Haar cascade. This technique can reduce the amount of money the government spends on elections. Overall, the goal of this project is to assist electoral commission of India employees while also minimizing intensive tasks.

Keywords: Face Recognition, online voting

I. INTRODUCTION

In India, there are now two different types of voting mechanisms: the secret ballot paper and the electronic voting machines (EVMs). However, the voting process itself has several flaws and disadvantages, which is why the current system is not very safe and secure. In the method i have selected to explore, we are suggesting three stages of verification, which is highly effective in lowering the instances of incorrect voting. The voter would receive a unique ID after registering, which is included in the first. Then, in the second level of security, when giving an ID to an Election Commission Officer, who will cross-check it, and now the new level of verification that a voter must go through, will greatly improve security. Here, we will be comparing the voter's current facial features with those in the database, which will lessen the likelihood of a false vote being cast and make the systemsafer and more accurate. I shall talk about the sole algorithm applied to facial recognition. By actually putting thisalgorithm into operation and testing it into the test set, we have also determined its accuracy.

II. LITERATURE SURVEY

The Voter ID card is replaced with a RFID Card which serves as an access to the individual on the day of voting Radio Frequency identification (RFID) it Is used to identification of people object [1]. This article is used improving the security and this system provides a better security as it ensures that no voter is allowed to vote more than once. In this project. OTP will be. Send to voters mobile phone and OTP is a password that is only valid for a single login sessions. Those improving this security [2]. which, in comparison to PC systems, generally have constrained computational and memory capabilities. To solve the shortcomings of each real-time mobile platform implementation, this approach combines two earlier real-time implementations. The primary implementation provides an on-demand or online light source modification for the second usage, which is regarded as resilient to different facial positions or orientations. A method to pattern categorization that discusses each pixel in a picture as a coordinate in a high-dimensional space is [3].

III. PROBLEM STATEMENT

Giving voters practical voting tasks to complete utilising a range of ballot designs would be the fundamental methodology as it relates to onlinevoting systems. Performance on voting tasks is assessed using elements likeaccuracy, time, and workload. The voting server gathers the ballots and eliminates any duplicate or fraudulent ballots. Then, each voter can verify that their vote has been counted online.

IV. MOTIVATION

This project focuses on creating an online voting system that uses facial recognition registration and a one-timepassword that is produced specifically for each voter for each election, enabling voters to participate in the elections no matter where they are physically located.

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V. AIMS AND SCOPE OBJECTIVES

A real-world case study will be used to develop a solution that employs several degrees of security authentication to enhance political party election procedures.

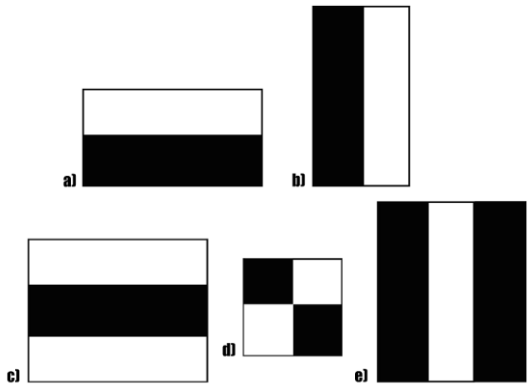
Targets include:
1. To develop a safe online voting system that uses one-time passwords and face recognition technology to assure the validity of votes and voters.
2. To strengthen voter identification since biometric functions cannot be shared.
3. To reduce the inconvenience of standing in line throughout the election's voting period.

VI. IMPLEMENTATION

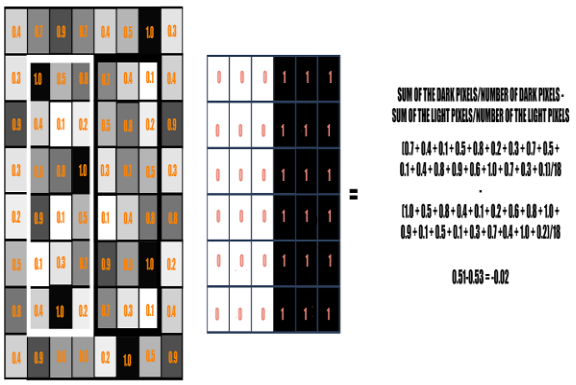
Helen Chan Wolf, and Charles Bisson performed the first-ever Face Detection using a computer. Face features like the pupil center, the inside and outside corner of the eyes, and the widows peak in the hairline had to be manually located. Twenty distances, including the breadth of the mouth and the eyes, were calculated using the coordinates. In this way, a person could process around 40 images in an hour and create a database of the calculated distances. Then, a computer would automatically compare the distances for each image, figure out how far apart they were, and then return the closed records as a potential match.

It is an Object Detection Algorithm that is used to find faces in still photos or moving videos. The edge or line detection features Viola and Jones suggested in their 2001 study "Rapid Object Detection using a Boosted Cascade of Simple Features" are used by the technique. To train, the algorithm is given a large number of positive photos with faces and a large number of negative images without any faces.3

Features



The introduction of the haar traits mentioned above was the initial contribution to the research. With the help of these features, it is simple to identify the image's edges, lines, and spots where the pixel intensities suddenly change.



example depiction of a picture with pixel values ranging from 0.0 to 1.0 is shown on the left in the rectangle. A haar kernel, which has all the bright pixels on the left and all the dark pixels on the right, is represented by the rectangle in the

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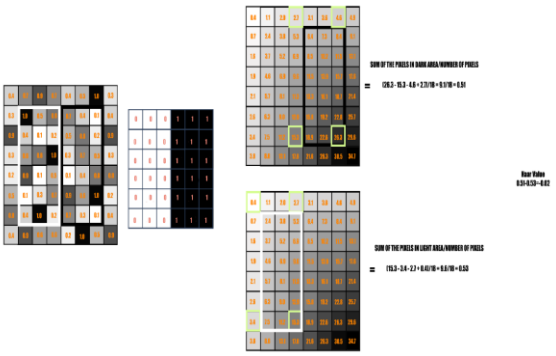
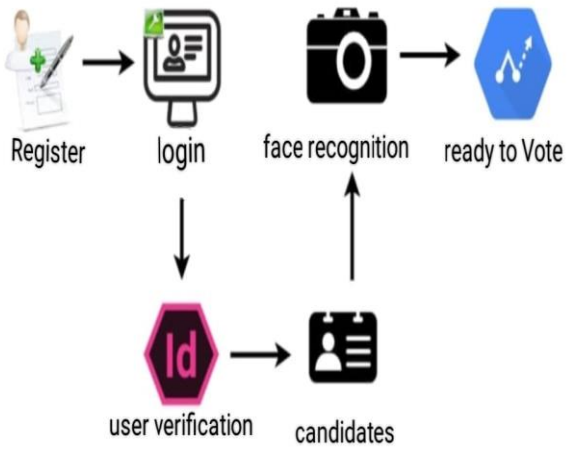
centre. The haar computation is performed by comparing the average pixel values at the lighter and darker regions, and then calculating the difference. The haar feature will detect an edge if the difference is near to 1.the haar attributes There would be a lot of mathematical calculations involved in traversal on an image. It requires 18-pixel value increases for a single rectangle on either side, as can be seen (for a rectangle enclosing 18 pixels). Imagine carrying out this operation for the entire image, with all haar feature sizes. Even with a high-performance system, this would be a busy operation.
Additionally, there are presently more haar features that can recognise any new picture structures as well as edges that run in different directions. To detect an edge anywhere in the image, the haar feature must span the entire thing.The haar feature continuously goes from the top left of the image to the bottom right in order to locate the particular characteristic. This is only a graphic representation of the whole haar feature traversal. When performing its genuine function, the haar feature would truly travel pixel-by-pixel across the picture. The haar characteristics will also be applied in every size imaginable.Based on the feature that each of them falls under, they may be roughly split into three groups. Whether the edges are horizontal or vertical is determined by the first pair of rectangular properties (as shown above). Using the second set of three rectangular features, determine if a lighter zone has darker areas on each side of it, or vice versa. The final group of four rectangular features is in charge of determining variations in pixel brightness across diagonals. the haar attributes There would be a lot of mathematical calculations involved in traversal on an image. It requires 18 pixel value increases for a single rectangle on either side, as can be seen (for a rectangle enclosing 18 pixels). Imagine carrying out this operation for the entire image, with all haar feature sizes. Even with a high performance system, this would be a busy operation.



using an integral image to calculate Haar. In this instance, the image's pixel intensities abruptly alter as they move vertically from the left to the right.
To determine what value of haar is calculated when there is a quick change in intensities travelling from left to right in a vertical manner, we will repeat the procedure described before, in contrast to the prior scenario, the haar value in this instance is 0.54, which is nearer to 1.

A. System architecture



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CONCLUSION

By integrating this function with our current voting system, it will be increasing its capabilities and make it more secure and free from fraudulent voting. Face recognition has long been a more reliable and secure form of authentication. And also, have only provided the Haar cascade algorithm. Additionally, have contrasted their performance according to how well they identify faces in the photographs. Our training set was made up of pictures. The training set's photographs were enhanced to further highlight their features.

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