# Smart Online Voting System
# Using OTP Authentication and Face Recognition

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## Abstract

The basic idea of this proposed system is to create an Online Voting System that will help to suppress deceive of the manual voting system and also the prior versions of online voting by camera for Face Recognition and OTP generation. We are also implementing location free voting system to the voters for whom it is not possible to come at the voting location (hometown). Here we propose a system that includes multiple layers of verification to ensure the reliability of the device which includes face verification and then OTP verification with validation data. Each voter can access to the system only when being recognized and checked with the given database of enlist voters. Once the corresponding face is matched with the information provided, the voter will be allowed to proceed for choosing their preferred candidate from the panel.

## Keyword

Smart Voting System, Voter ID, OTP, Facial Recognition, winning party, python, OpenCV.

## [I] Introduction

Elections are inevitable happenings in a democratic society and it is the sole responsibility of both the government and the citizens to make sure that it happens safely and securely and also it take place smoothly. By means of this system, the person is required to record his face before the election and the same is taken to account to compare while voting. The program for the desktop application manages the Individual Database. If a citizen casts his vote, the system sends a confirmation message as 'voted successfully' that the vote is successfully registered. In the process of voting, voicing their choices or articulating views. The main goal of this project is to make sure a voting system is designed using face recognition technology and OTP system to vote from any place on earth where internet is available. The Voting information is stored in the server database. As the world is changing day by day and is essential to adapt to the electronic world inorder to survive and meet world standards. This new technology refers to electronic voting systems where election is conducted online but has a central database for smooth data transfers and result calculation. Therefore an smart voting system has to be designed and employed for a fair election to take place.

**[II] Architecture**
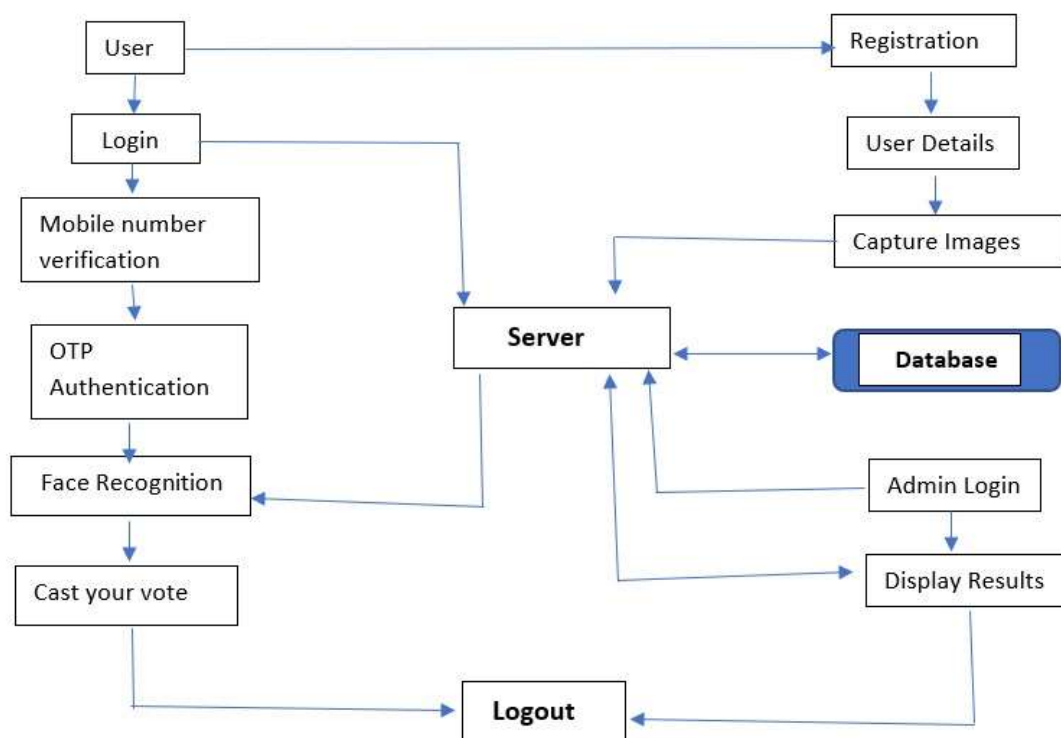


**[III] Literature Survey**

1.  Paper Name: SMART VOTING THROUGH FACE RECOGNITION
    Author: Mahalakshmi Mabla Naik,Dr. Preethi N. Patil

    In this paper, there are three degrees of confirmations which are user id confirmation, voter card number confirmation and face recognition confirmation.

2.  Paper Name: ONLINE VOTING SYSTEM USING FACE RECOGNITION AND OTP(ONE TIME PASSWORD)
    Author: Ishwari Pawar, Shruti Ragade, Akshada Zaware

    In this paper, it includes system with multiple layers of verification to ensure the reliability of the device which includes face verification and then OTP verification with validation data for voting.

3.  Paper Name: Smart voting system using Face Recognition
    Author: Nandan Gowda, Jayam Haresh Tharun,

In this paper, it aims to build a smart voting system using face recognition technology that allows any voter in INDIA by going to their respective constituency from "ANYWHERE IN INDIA" to the nearest voting booth in the place of stay

4. Paper Name: Smart Voting System using Facial Detection
   Author: Chandra Keerthi Pothina , Atla Indu Reddy

   This paper focuses on a system that uses faces to unlock the voting system just like in your phone and does not require physical presence to cast a vote as the traditional system does.

5. Paper Name: Decentralized Online Voting using Blockchain and Secret Contracts
   Author: Aaron Fernandes, Karan Garg

   This paper proposes a blockchain-based e-voting system with secret contracts.They have used Enigma (a secure multiparty computation platform) to design secret contracts.

6. Paper Name: Application For Online Voting System Using Android Device
   Author: Himanshu Vinod Purandare

   This paper focusses on designing online voting system using android application having two stage authentication technique i.e. Facial recognition and One Time Password (OTP) which will give better system security and vote casting become less time consuming process and it will provide better results.

7. Paper Name: Mobile Based Facial Recognition Using OTP Verification for Voting System
   Author: Ms.Ashwini Ashok Mandavkar

   This paper focusses on developing this project which will store the identity of the voters using android mobile through facial recognition systems. After the confirmation of valid face detected, the OTP (One- Time Password) is generated and send to the voters registered mobile number. Then the voter is validated and he is allowed to do the voting

8. Paper Name: Smart Voting Web Based Application Using Face Recognition, Aadhar and OTP Verification
   Author: B. Singh, Sh. Ranjan, D. Aggarwal

   In this paper, the voting process has three security stages. The first stage is facial recognition, the second stage is Election ID (EID) number verification, and the third stage is OneTime-Password (OTP) verification using the user's mobile phone number registered.

9. Paper name: Online Voting Using Face Recognition and Password Based Security System
   Author: R. Sandhiya , D. Indumathy

   This paper proposes online voting system which has two levels of security. In the first level of security, the face of the voter is captured by a web camera and sent to the database. Later, the face of the person is verified with the face present in the database and validated using Matlab. A password (OTP) is used as the second level of security, after entering the one time password generated to their mail it is verified and allow to vote.

10. Paper Name: Smart Online Voting System
    Author: Ganesh Prabhu S, Nizarahammed. A

This paper focusses on a system where the user can vote remotely from anywhere using his/her computer or mobile phone and doesn't require the voter to got to the polling station through two step authentication of face recognition and OTP system. This project also allows the user to vote offline as well if he/she feels that is comfortable. The face scanning system is used to record the voters face prior to the election and is useful at the time of voting. The offline voting system is improvised with the help of RFID tags instead of voter id.

## [IV] Methodology:

For the face detection Viola Jones algorithm is used.

The algorithm has four 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: Adaboost Training – In Viola-Jones algorithm , given a sub-window size of 20 x 20 , there are totally 45891 possible features. They are created using trainers (for example Adaboost) which are feed with hundreds of images and they find the best Haar features. It exits many face datasets to train the adaboost.

Stage 4:  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.

For face recognition, Local Binary Patterns Histogram method of OpenCV is used.

LBPH analyzes each face in the training set separately and independently. It characterize each image in the dataset locally; and when a new unknown image is provided, we perform the same analysis on it and compare the result to each of the images in the dataset.

## [V] Working:

Our proposed system allows user to vote online instead of going offline procedures. For voting online, user must record their details and face in the system provided. The unique

details of each user along with their face image is captured multiple times and stored in the database given. Multiple instaces are captured to ensure accuracy at time of voting. Once the voter has registered their face in the system and has provided all their details he/she is ready to cast a vote. The voting process during the election is completely through the internet and is enabled only during the scheduled time of election. The user must possess a good internet connection, a webcam for face recognition process, mobile phone for otp authentication process for a smooth process . During the election time goes through two step authentication. The first is through otp authentication. The user gets an OTP to his /her registered mobile number. The user is then prompted to enter that OTP in the system and after OTP matches the user is proceeded to the next step of authentication. The second is through facial recognition. When the user authenticates with his face through the webcam the system compares the given face with the images recorded in the database. If the user's face is recognized , then it goes to next step. In the next step, the user can select a party and cast a vote. Thus the voting process is completed successfully. This system allows the whole family members to vote using one system as the process can be repeated n number of times since all requires is a mobile phone and computer. Once the voting process is completed or even before the user has voted anyone can see the results of the ongoing election through website provided. While publishing result, database for voting counts is updated frequently thereby avoiding any mistakes to takes place. This greatly reduces the time taken to publish the results, counting the votes as it is completely handled by the machine in matter of seconds. Thus the system greatly avoids the chaos going at the time of election and will also reduce labor force, money and time.

**[VI] Conclusion:**

The proposed system is to develop a secure internet voting system based on otp authentication and face recognition which tries to overcome all the drawback which occurs in a traditional or current voting system. It also has many strong features like verifiability, convenience, correctness, etc. For this system, there is no requirement of an election officer, paper ballot, or any electronic voting machine only the internet connection, mobile phone for otp authentication and desktop/laptop with a camera for face authentication is required so that one can vote from anywhere securely.

**[VII] References**

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