

Online Smart Voting System Using Image Processing and CNN

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Abstract: India being a democratic country, still conducts its elections by using voting machines, which involves high cost and manual labor. Web-based system enables voter to cast their votes from anywhere in the world. Online website has a prevented IP address generated by the government of India for election purpose. People should register the name and address in the website. Election commission will collect the fingerprint and face image from the voters. The database or server will store the images. When the images are obtained on the casting day, it will be compared with database and provides a secured voting on the Election Day. System utilizes faces and fingerprints to unlock the voting system, similar to the mobile phone are used. The current system requires the physical presence of voter, which is inconvenient to many voters. The process consumes less times well. Using the detection of face and fingerprint images, the number of fake voters can be reduced. The eyes and eyebrows distance remains constant with growing age to make the system more secure. This research work utilizes ten print images to detect the correct name of voter.

Keywords: Online Website voting, Face Capturing, Face recognition using Haar cascade, preprocessing of fingerprints images, Fingerprints images matccascad using CNN.

INTRODUCTION

Elections are the foundation of any democracy and 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. The current system has a lot of loopholes like the possibility of duplicate votes, rigging EVMs, faking the count, all of which tampers the true meaning of democracy. Through the Smart voting system that uses facial and fingerprint recognition, people who do not live in the same place or the old or someone, who cannot wait in long queues for a long time will be benefitted. The voter can comfortably vote from anywhere and the possibility of duplication of the vote is also reduced through the same. This Online Voting System uses Image processing to detect voter's faces by using haar Cascade Algorithm. Face and fingerprint image features are exacted and compared with the database. Importantly, the system developed is entirely web-based which is very inexpensive compared to the present systems.

OBJECTIVE

The main objective is reviewing the current voting process. Coming up with an automated voting system and implementing an automated / online system. Validating the system to ensure that only legible voters are allowed to vote.

LITERATURE SURVEY

This chapter contains the existing and established theory and research in this report range. This will give a context for work which is to be done. This will explain the depth of the system a literature survey represents a study of previously existing material on the topic of the report. This literature survey will logically explain this system.

Smart Voting System Using Facial Detection. Auther of this paper, Chandra Keerthi Pothina, Atla Indu Reddy, discusses an approach which is more accessible, secure and efficient than the existing system which has many defects such as lengthy process, time taking, not being secure enough, bogus voting. Unique features like the distance between the eyes and eyebrows never change regardless of aging. The designed system is also less time-consuming, inexpensive and a hassle-free way of conducting the election process, making smart voting a better way to vote [1].

CNN Automatically Learn The Significance Of Minutiae Points For Fingerprint Matching. Auther of this paper, Anurag Chowdhury, Simon Kirchgasser, Andreas Uhl, Arun Ross, The purpose of this work was to determine whether a representation learning Scheme would automatically deduce the significance of minutiae points for fingerprint matching. In this regard, we designed a Multi-scale Dilated Siamese CNN architecture capable of extracting scale and rotation invariant Image features for comparing fingerprint patches. The proposed CNN was trained to perform fingerprint matching without explicitly being made aware of the concept of minutiae points [2].

Biometrics Based Secured Remote Electronic Voting System. Auther of this paper, Samarth Agarwal, Afreen Haider, In the present paper, a system has been devised which overcomes most of the problems Faced in the existing voting system. This system will ensure a more secure voting process surely, which is quite required for the overall growth of a developing nation. The fingerprint based voting system that has been proposed in this paper is faster and more efficient than the systems reported in literature previously [3].

Block Chain Based Secure Voting System Using IOT. Auther of this paper, Suresh Kumar, Tamil Selvan G M, This paper has developed a new approach for contactless fingerprint minutiae detection using deep neural network that incorporates atrous spatial pyramid pooling. This paper Also Presents the cross-database contactless fingerprint performance evaluation that trains the network using the images acquired during this work and the performance is evaluated using the two other public databases, without incorporating any fine tuning [4].

PROBLEM STATEMENT:

Even though our country has taken steps toward digitalization of India, considering the progress of voting system it still has some flaws. Registration of votes is being possible only if people go to polling booths for the current system. During the time of voting, voter’s name is listed in the list of his/her respective area. They cannot vote outside the vicinity of address mentioned in the voting card. So, we are designing proposed smart voting system which uses face and fingerprint recognition by using the Image Processing and Convolutional Neural Network.

MOTIVATION

- To avoid electoral or election fraud in the process of election in which voters vote repeatedly for a favored party therapy increasing vote share.
- In order to conduct elections ethically, this election fraud should be eliminated. Hence, the automatic voting system using CNN has been proposed.

SYSTEM ARCHITECTURE:

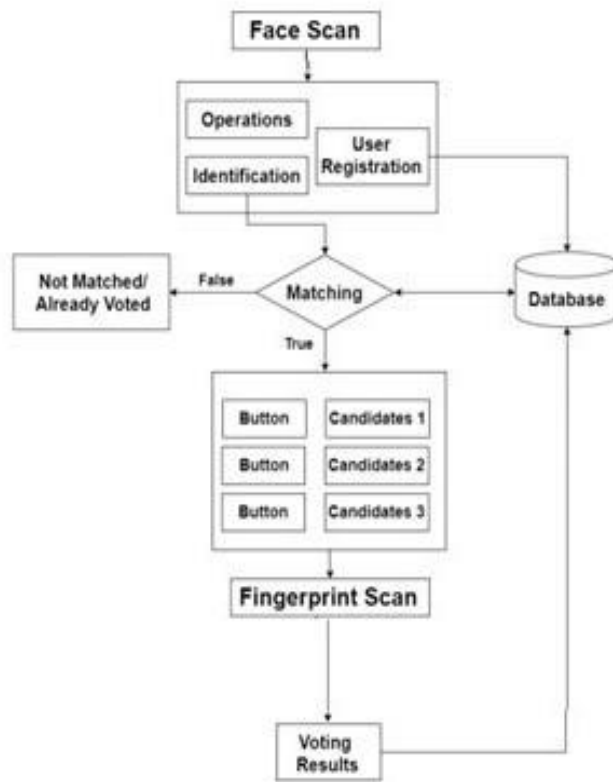


Fig – 1: System Architecture Diagram

The proposed on-line vote casting machine with biometric authentication is an digital vote casting machine which seeks to utilize the individuality of the trivia of the human fingerprint and face reputation to in addition beautify the extent of consider and confidentiality of the citizens withinside the machine in addition to making the real technique as universally available as viable which could be accomplished via the deployment at the Internet.

For the voter registration and authentication strategies which might be executed at the module, the voter is predicted to have his or her fingerprints captured, Face reputation and the trivia extracted this is saved at the database. This is executed to save you the incidence of more than one registrations or identity. Thus, all through the authentication length, citizens are predicted to go through an identical verification in their fingerprint samples and Face reputation in opposition to the values saved withinside the database that is diagnosed via the usage of a completely unique voter identity wide variety assigned all through registration

MATHEMATICAL MODEL:

• **S = (I, O, F)**

Where,
S: System

• **I= {VL, CH} are set of Input**

Where,
VL: Voter Login
CH: Choice

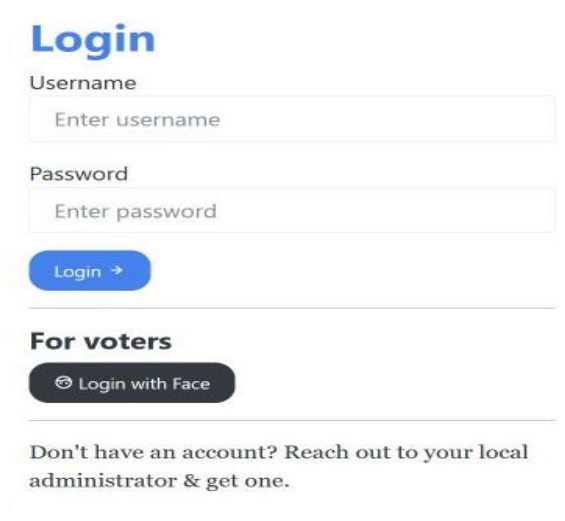
• **F = {A, FR, VP, VC} are set of Function**

Where,
-A: Authentication
-FR: Face Recognition
-VP: Vote Processing
-VC: Vote Counting

• **O = {N, VR} are set of Output**

Where,
-N: Notification
-VR: Voting Result
• **Success Condition:** Valid Voter ID, Valid Choice.
• **Failure Condition:** Invalid Voter Id, Invalid Face, No Internet Connection.

Screenshots:



Candidates

New candidate

Name

Email

Mobile

Date of birth

Address

Candidates List

Name	Email	Mobile	Address
Donovan Macias	teqyme@mailinator.com	80	Enim Esse Commodo Et
Kellie Hall	doby@mailinator.com	31	Eos Velit Aliqua M
Callum Fernandez	zariqyfot@mailinator.com	90	Dolore Aut Ut Debiti

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Vote for College Voting event

Vote for your candidate

Donovan Macias

Kellie Hall

Thumb real-fingerprint-25787622.jpg

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Events List

Name	Date	Status	Candidates	Winner
College Voting	May 13, 2022	Completed	Candidates List	Kellie Hall
Tucker Jones	May 12, 2022	Completed	Candidates List	Donovan Macias
Iona Skinner	May 11, 2022	Completed	Candidates List	Callum Fernandez

Algorithms:

1. Haar Classifier Algorithm:

Haar-like features is the core basis for Haar classifier object detection. Instead of using the intensity values of the pixel, it changes the contrast values between adjacent rectangular groups of pixels. Using contrast variances between the pixel groups. Haar-like feature is formed by two or three adjacent groups with relative contrast variance. Scaling of Haar features can be done easily by increasing or decreasing the size of pixel group, which allows features to be used for various sizes by detecting the objects. It allows accuracy of a classifier to vary only once. This algorithm has achieved 95% accuracy rate for human face detection by using 200 simple features which was experimented by Viola and Jones. Haar classifier cascades are to be trained first for detection of facial features of human such as mouth, eyes, and nose. As for the training of classifier Haar feature algorithm needs a gentle AdaBoost algorithm along with it. But as Intel has developed an open-source library which makes it easy for the implementation of computer vision related programs known as Open Computer Vision library (OpenCV). The algorithm is trained to detect a face by Haar features by sequence of square-shaped functions.

2. Pre-Processing Using Tenprint Image:

When two fingerprints image are same, we can use tenprint image method. Ten finger print images are taken and features for each fingerprint images in the database.

Tenprint image algorithm:

Step 1: Input-

We are taken the input image

Step 2: Binarization of Image:

Gray image is converted to binary image

Step 3: Thinking of Image

To eliminate the redundant pixel and Training algorithm.

Step 4: When two fingerprint images are same in the Database. We apply tenprint images.

Step 5: Ten fingerprint images are taken, positing of finger record and count are determined.

Step 6: Latent image is compared with the of finger record and count are determined.

Applications:

This project can be used as voting machine to prevent ringing.

- Panchayat level election.
- Society level election.
- To conduct general assembly elections where number of candidates are less than or equal to eight in the current situation.

Advantages:

- ▶ 1. Time conscious, less time required for voting and counting.
- ▶ 2. Provide fearless of violence and that increases the percentage of voting.
- ▶ 3. Allow voter to vote at given time on day of election and also allow voter to vote from anywhere in his/her state or out of state.
- ▶ 4. Avoids invalid voting as it prevents unregistered voters from voting.

Disadvantages:

1. User must have reliable connectivity.
2. User must have Hardware with Webcam.

Conclusion and future scope:

The main objective is development of an online voting system using webcam as an authentication technique. Thus, security increases as there is extra level of authentication. It will provide fearless and violence free voting that will increase the percentage of voting for strengthens the democracy.

Future Work:

1. For more authentications, Video Streaming can be implemented instead of the photo uploading using the webcam.
2. Mobile Application can be developed for Online Voting System so that it can provide more ease to user.

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References:

- [1] Chandra Keerthi Pothina, Atla Indu Reddy “Smart Voting System using Facial Detection” IEEE Journal, April 2020.
- [2] Anurag Chowdhury, Simon Kirchgasser, Andreas Uhl, Arun Ross “CNN Automatically Learn the Significance of Minutiae Points for Fingerprint Matching?” IEE1E Conference, Mar 2020.
- [3] Samarth Agarwal, Afreen Haider, “Biometrics Based Secured Remote Electronic Voting System”. IEEE Conference, Sep 2020.
- [4] Suresh Kumar, Tamil Selvan G M,” Block chain Based Secure Voting System Using Lot”, IEEE Journal, JAN 2020.
- [5] Hanzhuo Tan, Ajay Kumar, “Towards More Accurate Contactless Fingerprint Minutiae Extraction and Pose-Invariant Matching” IEEE Conference 2020.
- [6] Chengsheng, Yuan, Zhihua, Xia, “Fingerprint Liveness Detection using an improved CNN with image Scale Equalization” IEEE Journal 2019.
- [7] Hui Xui, Miao Qi, “Multimodal Biometrics Based on Convolutional Neural Networks by Two Layer Fusion” IEEE Conferences 2019.