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SMART VOTINIG SYSTEM USING FACE AND FINGERPRINT RECOGNITION

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Abstract

The aim of this paper is to utilize the voting system in large democracy countries, but in the present the fair election process is facing lot of problems like illegal votes, fake voting, tampering with the Electronic Voting Machines(EVMs).Being a engineers, it is our responsibility to avoid plague. In the commonly used EVMs the voting process takes place electronically and this eliminates the use of ballot paper to cast votes in elections as it is very time consuming. The election department will collect the face images and fingerprint from the voters. The database will store the images when the images are obtained on the casting day, it will compared with database and provides a secured voting on the election day.

Keywords: Online voting, Face Capturing, Face recognition using HAAR cascade, Fingerprints matching using CNN.

I. 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 know in our country has defects and loopholes, which are being used for the advantage of the contestants and political parties. The current systems 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 this project, we propose developing a novel biometric based voting frame work in order to curb the above illustrated problem of rigging.

Though the smart voting system that uses facial and fingerprint recognition. This online voting uses image processing to detect voters faces by HAAR Cascade Algorithm. Face and fingerprint image features are exacted and compared with the database. The system proposed in the present paper, shall serve with a set of innovative advantages namely, and reduced rigging and fake/invalid votes, ease of carrying the machine, faster and most accurate voting process.

II. LITERATURE SURVEY

Although there are many research works on online / smart voting systems, here in this chapter we have critically analysed and summarized several research works and projects, which are more recent and relevant and similar to project. This literature survey will logically explain the system.

1.**Block Chain Based Secure Voting System Using IoT:** Author of this proposed model is Suresh Kumar, Tamil Selman G M, This methodology has developed a new approach for contactless fingerprint minutiae detection using deep neural networks that also include Atrous spatial pyramid pooling (ASPP). This method also presents the cross-database proximity-based fingerprint performance evaluation that trains the network using the images attained during this work and the performance is evaluated using the two other public databases, without integrating any fine tuning.

2.**Biometrics Based Secured Remote Electronic Voting System:** Author of this proposed model is Samarth Agarwal, Afreen Haider, In this present proposed paper, a system has been devised which overcomes most of the problems faced in the existing voting system. This system will guarantee 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.**Smart Voting System Using Facial Detection:** Author of this proposed model is Chandra Keerthi Pothina, Atla Indu Reddy, discuss an approach which is more accessible, secure and efficient than the existing system which has many defects such lengthy process, time taking, not being secure enough, bogus voting/fake voting. Unique features like the distance between the eyebrows and eyes never changes 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.

4. **CNN Automatically Learn The Significance Of Minutiae Points For Fingerprint Matching:** Author of this proposed model is Anurag Chowdhury, Simon Kirshwasser, Andreas Uhl, Arun Ross, The purpose of this work to determine whether a representation learning Scheme would automatically deduce the significance of minutiae points for fingerprint matching. In this regard, They 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.

5. **Online Voting System:** Author of this proposed model is Ropak T M, Dr. R Sumathi developed a scheme which provides the secured e-voting system by using biometric details and Virtual ID of voters obtained from the Aadhar database to cast the vote and also using the digital signature as the key for the encryption of the votes inside the block. Aadhar integration to the e-voting system overcomes the duplication or tampering of votes.

III. PROBLEM STATEMENT

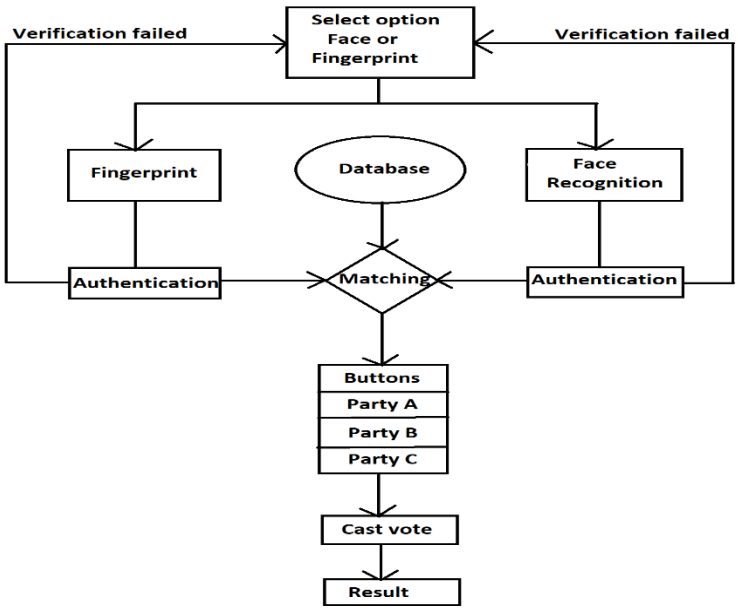
Even though our country has taken steps towards digitalization of India, considering the progress of voting system it has some flaws. Registration of votes is being possible only if people go to polling booths for the current system. During the time of voting, voter's name is listed in the list of his/her 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 Convolution Neural Network (CNN).

IV. MOTIVATION

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

V. SYSTEM ARCHITECTURE

FIG 1:



ARCHITECTURE

VI. BLOCK DIAGRAM

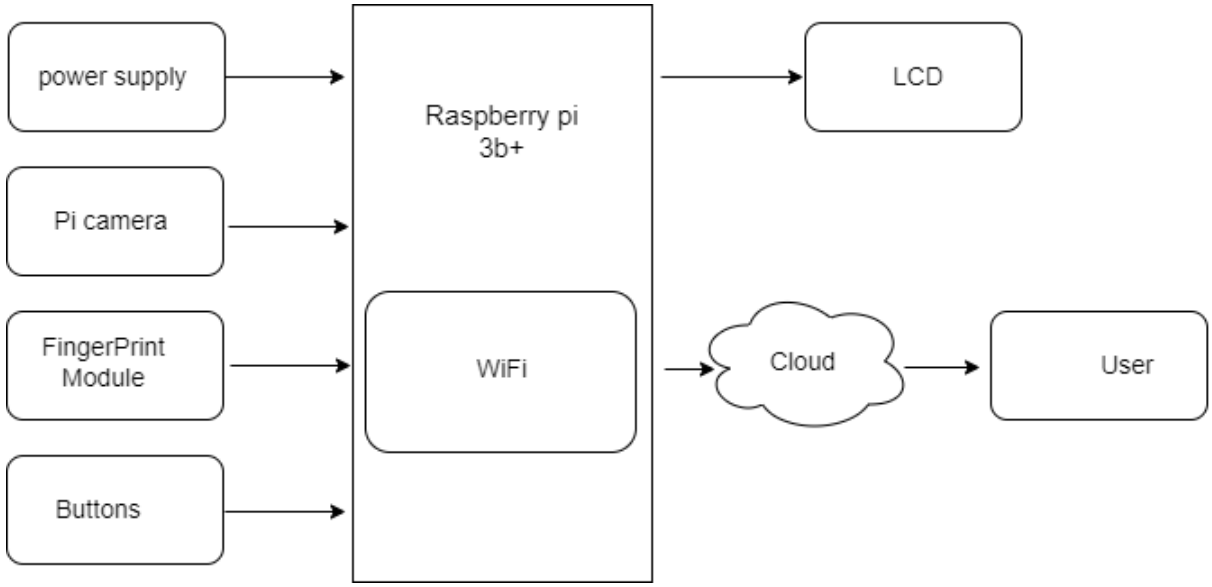


FIG 2: BLOCK DIAGRAM

VII. ALGORITHM

FACE DETECTION USING HAAR CASCADE:

HAAR Cascade is a popular object detection algorithm used in image processing for detecting objects of interest, such as faces. It is a machine learning-based approach that uses a set of HAAR-like features to detect objects in an image.

Here are the steps involved in face detection using HAAR Cascade:

1. Data collection: The first step involves collecting a large dataset of images of faces. This dataset is then used to train the HAAR Cascade classifier.

2. Training: The HAAR Cascade algorithm uses a set of positive and negative images to train a classifier. Positive images contain the object of interest, in this case, faces, while negative images do not.

3. Feature extraction: HAAR-like features are extracted from the training data. These features are basically rectangular areas of an image that differ in contrast. The HAAR-like features are calculated at different scales and positions in the image.

4. Classifier training: The HAAR Cascade classifier is trained using a machine learning algorithm, such as AdaBoost, to identify the best features for detecting the object of interest. The classifier uses these features to differentiate between positive and negative images.

5. Detection: Once the HAAR Cascade classifier is trained, it can be used to detect faces in new images. The algorithm slides a window across the image and applies the trained classifier to each sub-window. If the classifier detects a face, it returns the location of the face in the image.

6. Post-processing: To improve the accuracy of face detection, post-processing techniques such as non-maximum suppression can be used. This technique removes overlapping detections and keeps only the most confident detection.

Advantage of HAAR Cascade:

HAAR cascade-based face detection algorithms are known for their high accuracy in detecting faces in digital images and video frames. This is because the algorithm is based on training a machine learning model with a large number of positive and negative examples of faces.

HAAR cascade-based face detection algorithms are robust to variations in lighting conditions, pose, and orientation. This is because the algorithm is designed to detect the features of a face, such as the eyes, nose, and mouth, regardless of their position in the image.

Overall, HAAR Cascade is a powerful algorithm for face detection in image processing. It is widely used in various applications such as surveillance systems, biometrics, and image editing tools.

FINGERPRINTS RECOGINATION USING MINUTIAE CNN:

Fingerprint recognition is a popular biometric authentication technique that involves the identification of unique features on the surface of an individual's fingers. These unique features are known as minutiae points and are typically used to distinguish one person from another. In recent years, deep learning techniques such as Convolutional Neural Networks (CNNs) have been used to improve the accuracy of fingerprint recognition systems. In this answer, we will explain how minutiae CNN deep learning works in detail.

Minutiae Points Detection:

The first step in fingerprint recognition is the detection of minutiae points. These are the unique features on the surface of a finger, including ridge endings, bifurcations, and delta points. The process of detecting these minutiae points involves pre-processing the fingerprint image to remove noise and enhance the contrast between ridges and valleys. This is typically done using techniques such as binarization, thinning, and skeletonization.

Once the fingerprint image has been pre-processed, the next step is to detect the minutiae points. This can be done using various techniques such as orientation field analysis, template matching, and pattern recognition. In recent years, deep learning techniques such as CNNs have been used to improve the accuracy of minutiae point detection.

Minutiae CNN Deep Learning:

The process of using CNNs for minutiae point detection involves training a deep neural network using a large dataset of fingerprint images. The network is typically trained using a supervised learning approach, where the network is presented with input images and corresponding output labels (i.e., the locations of minutiae points in the images). The network learns to map the input images to the output labels by adjusting the weights and biases of the network using backpropagation.

The architecture of a CNN typically consists of multiple layers, including convolutional layers, pooling layers, and fully connected layers. The convolutional layers are used to extract features from the input images, while the pooling layers are used to reduce the dimensionality of the feature maps. The fully connected layers are used to classify the features extracted from the input images.

In the case of minutiae CNN deep learning, the input images are fingerprint images, and the output labels are the locations of minutiae points. The network is trained to identify these minutiae points in the input images by learning to detect the unique patterns and shapes associated with these points.

Advantages of Minutiae CNN Deep Learning:

There are several advantages to using minutiae CNN deep learning for fingerprint recognition. First, CNNs are highly accurate at detecting minutiae points, even in noisy or low-quality fingerprint images. Second, CNNs can be trained to recognize a wide range of minutiae patterns and shapes, making them highly adaptable to different fingerprint datasets. Finally, CNNs can be trained on large datasets, allowing them to learn to detect minutiae points with a high degree of accuracy and generalizability.

In conclusion, minutiae CNN deep learning is a highly effective approach for fingerprint recognition that involves using deep neural networks to detect unique features on the surface of an individual's fingers. This approach has several advantages over traditional techniques and has led to significant improvements in the accuracy and robustness of fingerprint recognition systems.

Virtual Network Computing (VNC) Viewer: Virtual Network Computing Viewer or VNC Viewer is a remote desktop software that allows users to connect and control a computer remotely. It uses the Virtual Network Computing (VNC) protocol to enable users to access and control a remote desktop from a different location.

With VNC Viewer, a user can connect to a remote computer and see the desktop as if they were sitting in front of it. The user can then interact with the remote desktop using their own mouse and keyboard, and access files and applications on the remote computer as if they were on their local machine.

VNC Viewer can be used for a variety of purposes, including remote technical support, remote working, and remote access to a home or office computer. It is available for various operating systems, including Windows, macOS, Linux, and mobile platforms such as iOS and Android.

VIII. IMPLEMENTATION RESULTS

1. Create a folder for the database.
2. Train the data and store into the database.
3. Click on Programming Icon in the Raspbian symbol.
4. Select the python IDLE and open.
5. click on the file menu and select open option.
6. Select the source code which was written in the python language.
7. After the selecting the code, click on the Run module.
8. After the compilation and execution of code, it will ask us to select the face or fingerprint.
9. The user can choose face or fingerprint option to vote by pressing 1 for face and 2 for fingerprint recognition.
10. Select 1 or 2 and it will compare the input data with database and validate.
11. Next, it will ask to vote your favorite party.
12. Please vote and your vote is done.

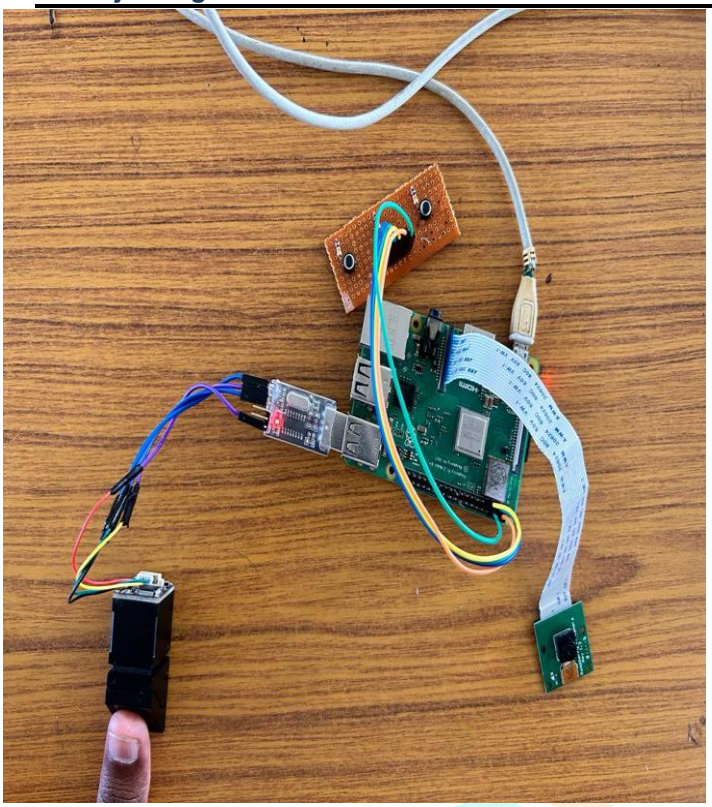


FIG 3:HARDWARE KIT

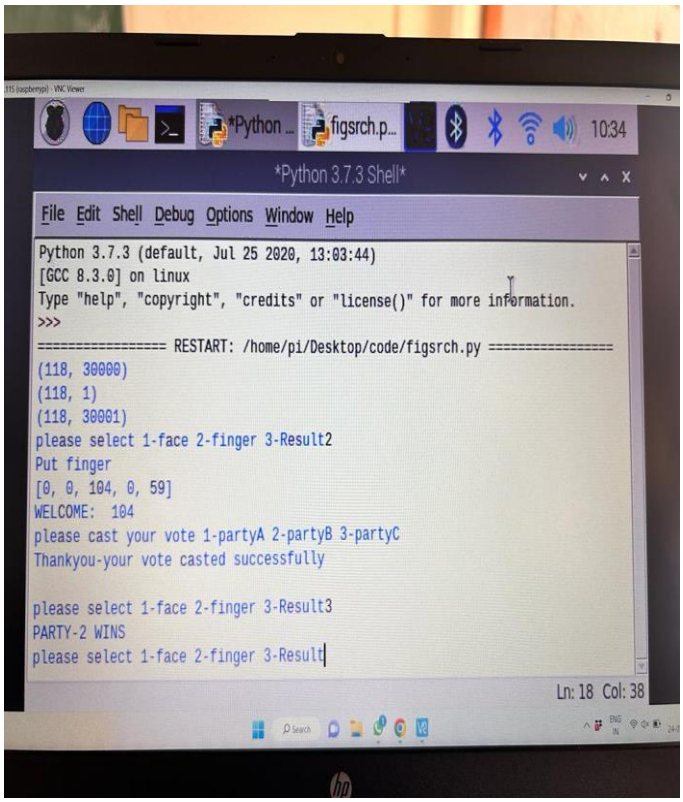


FIG 4:VNC VIEWER

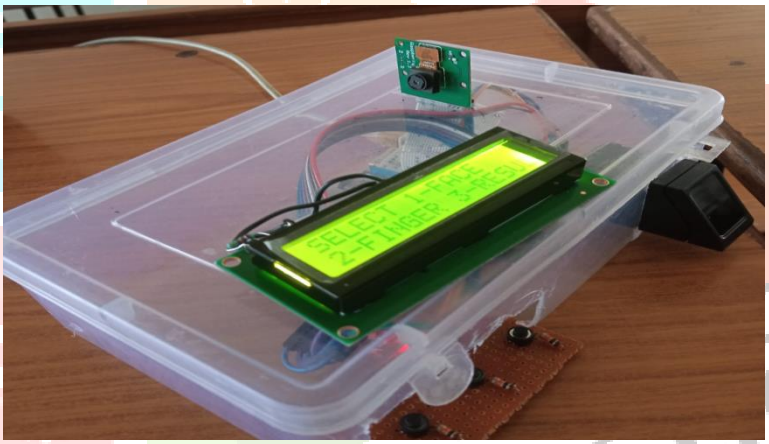


FIG 5: VOTING SYSTEM

IX. CONCLUSION

World is becoming completely digitized. As a part of digitization, here voting is also digitized. This Journal discusses which is more secure and efficient than the existing model. Time taking, vote is less than old system, bogus voting. Unique features like the distance between the eyes and eyebrows never change regardless of aging. Fingerprint features cannot be changed, but they can same for two members. But we can detect the database image which voter fingerprint is that using minutiae point detection and image of minutiae record. The designed system is also less time-consuming, making smart voting system a better way to vote.

X.REFERENCES

[1] Chandra Keerthi Pothina, Atla Indu Reddy "Smart Voting System using Facial Detection" IEEE Journal, April 2020.

[2] Anurag Chowdhury, Simon Kirshwasser, Andreas Uhl, Arun Ross "CNN Automatically Learn the Significance Of Minutiae Points for Fingerprint Matching?"IEEE Conference, Mar 2020.

[3] Samarth Agarwal, Afreen Haider, "Biometrics Based Secured Remote Electronic Voting System". IEEE Conference, Sep 2020.

[4] Suresh Kumar, Tamil Silvan G M, "Block chain Based Secure Voting System Using Lot", IEEE Journal, JAN 2020.

[5] Hangzhou Tan, Ajay Kumar, "Towards More Accurate Contactless Fingerprint Minutiae Extraction and Pose-Invariant Matching" IEEE Conference 2020.

[6] Chengsheng , Yuan, Zhuhai, 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.

[8] Abdelleratif EI Idrissi, Youssef El Merabet, "Palmprint Recognition using state-of the art Local texture descriptors." IEEE Conferences 2020.

[9] Uttam U. deshpande, V.S. Male math, " A Convolution Neural Network-Based Latent Fingerprint Matching Using the Combination of Nearest Neighbor Arrangement Indexing" IEEE Conference, JAN 2020.

[10] Giulia orru, Roberto Casual, "LivDet in Action Fingerprint Liveness Detection Competition" IEEE Conference 2020.