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DEEP LEARNING BASED IRIS RECOGNITION FOR VOTING SYSTEM

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***Abstract*—** In this paper, we are scanning an individual's iris and storing it in a voter's database by giving appropriate AADHAR card no. If an individual wants to cast a ballot, at that point their iris is distinguished and this recognized picture is contrasted with the picture in a voter's database..When the iris is recognized we get the information about the voter in our PC, then the person is allowed to vote. The current voting system is not secure, some individuals give dummy votes or they are registered at more than one place and some traditional model-based iris recognition gives high false detection rate and low processing speed. In this paper, the security of the voter is discussed and in general and the focus is on making the voting system more robust and reliable by eliminating dummy voters. This paper researches another profound learning-based methodology for iris acknowledgment and endeavors to improve the precision utilizing an increasingly streamlined system to all the more precisely recuperate the delegate highlights. We consider the AlexNet Convolutional Neural Network transfer learning model for iris images features extraction and recognition, which not only results in a simplified network but also results in outflanking coordinating exactness more than a few traditional and best in class calculations for iris acknowledgment.

Keywords— Iris Recognition,Image processing, AlexNet CNN,Deep learning

I. INTRODUCTION

In current world, numerous new systems, for example, casting a ballot procedure assume a significant job in any fair nation. Democracy is meant to allow people to vote freely and the election result is accepted by voters group. The idea of Iris Recognition was first proposed by Dr. Plain Burch in 1939.These calculations utilize techniques for design recognition and some scientific computations for iris recognition. Iris recognition is a strategy for biometric validation that utilizations design recognition systems dependent on high-goals pictures of the irises of a person's eyes. Iris is a muscle inside the eye that manages the size of understudy, controlling the measure of light that controls the eye. All things considered, physical qualities are not something that can be lost, overlooked or went starting with one individual then onto the next. They are extremely hard to forget and criminal would think twice before committing a crime involving biometrics. The idea of Iris Recognition was first proposed by Dr. Frank Burch in 1939.It was first implemented in 1990 when Dr. John Daughman created the algorithms for it.

To get the information about the voter we need some existing database, so we are using here AADHAR card from which we get the entire information about the voter i.e.name, address, phone no, blood group etc. This voting system provides better security than the existing system. Iris checking is viewed as the most secure than the thumb filtering or face recognition. Our system also reduces the man power that is required during the voting. It also reduces the time required to declaring the voting result. We do not need to mark an inedible ink on voter's left forefinger because ink is mark to show that this person has given vote but in our system in the database it gets updated that the particular person has given vote.

II. STATE OF THE ART (LITERATURE SURVEY)

A- Comparison of Various Segmentation Techniques in Iris Recognition

AUTHORS: Prateek Verma, Maheedhar Dubey, Praveen Verma

Iris recognition is viewed as the most dependable and exact biometric recognizable proof framework accessible. Iris recognition is viewed as the most solid and precise biometric recognizable proof framework accessible. Iris acknowledgment system gets an image of an individual's eye; the iris in the image is then distributed and institutionalized for incorporate extraction process. The presentation of iris recognition frameworks exceptionally relies upon division. Division is utilized to find the right iris locale in an eye and it ought to be done precisely and accurately to evacuate the eyelids, eyelashes, reflection and pupil clamors present in iris region. In our book we are comparing two segmentation methods namely, Daugman's algorithm and Hough Transform. Iris pictures are browsed the CASIA Database, by then the iris and understudy limit are perceived from rest of the eye picture, ousting the disturbances. The portioned iris district was standardized to dispose of dimensional irregularities between iris locales by utilizing Daugman's Rubber Sheet Model A comparative analysis is made of the two methods to find out the better method.

B. Segmentation Techniques for Iris Recognition System
AUTHORS: Surjeet Singh, Kulbir Singh

A biometric framework gives programmed distinguishing proof of an individual dependent on a novel component or trademark controlled by the individual. Iris recognition is viewed as the most solid and precise biometric ID framework accessible.. Iris recognition frameworks catch a picture of a person's eye, the iris in the picture is then portioned and standardized for include extraction process. The exhibition of iris acknowledgment frameworks exceptionally relies upon division and standardization. This paper talks about the exhibition of division procedures for iris recognition frameworks to build the general exactness

C. The Design and Development of Real-Time E-voting System in Nigeria with Emphasis on Security and Result Veracity
AUTHORS: Adebayo, O. S, Damian, O., Mohammed, D

Races are accepted to be the key mainstays of majority rules system and casting a ballot is one of the discretionary procedures that guarantee the sustenance of vote based system in any affable society. Right now, built up an electronic democratic framework, which will take out apparatus and control of results to its barest least, this issue is for the most part connected with the manual arrangement of casting a ballot. The execution of electronic democratic framework in Nigeria will help the respectability of INEC and the outcome they produce. The projects used to build up this framework are PHP, MySQL, Java Query, CSS and HTML. These bundles make the Graphic Interface User amicable enough for even those with practically no PC information

D. Secure e-voting system with Biometric and Wavelet Based Watermarking Technique in Ycgcb color space
AUTHORS: Gunjal B., and Mali S

Secure Voting System' is heart of any democracy.There are number of the country over tossing a democratic structure framework got a handle on any place all through the world, yet every one of them has their own difficulties. The remote web casting a ballot frameworks despite everything endure numerous issues. These are reasons, why manual democratic is still by and by in many creating and created countries right now too. In this way, complete, firmly verified and easy to use 'E-Voting System' is need of time. The point of this paper is to exhibit multilayer verified, web based democratic framework utilizing biometric and wavelet based picture watermarking. Firmly verified watermarking procedure for voter's shading photo in YCgCb shading space is prepared by installing voter's unique mark as watermark. The watermark installing is done safely through number of levels. This system yields Peak Signal to Noise Ratio (PSNR) up to 54.26 and Normalized Correlation (NC) equivalents to 1 showing definite recuperation of unique mark.The complete system is maintained `user friendly'.

E. E-VOTING SYSTEM USING MOBILE SMS

AUTHORS: Dinesh R. Gawade, Amardeep Shirolkar

Electronic voting system has the potential to improve percentage of the voting. In the customary democratic, for example, the hardware casting a ballot and paper based democratic, level of casting a ballot is diminishing. Present day's the vast majority of voters are occupied in their work and a large portion of the voters are living far away from casting a ballot place. a few voters don't care to hold up in lines. Therefore, because of this, voters don't visit to the surveying corner. Along these lines, level of casting a ballot is diminishing, which is principle and genuine downside of conventional democratic plan. Presently a day's some improvement is required right now. Along these lines, right now are presenting such a framework, which will dispense with disadvantage of customary democratic plan. This new democratic plan depends on SMS. SMS is a key fate of the subsequent age (2G) portable. In the subsequent age, GSM (worldwide framework for versatile correspondences) is extremely celebrated innovation. In up and coming age of versatile, for example, 2.5G, 2.75G, 3G and 4G, SMS is one of the prime highlights. So we actualize another democratic framework, in light of SMS. Portable communication is generally utilized, there are more than 6,800,000,000 versatile clients worldwide and populace of the voter in world is 7,012,000,000 that is 96.97% voter utilize portable around the world. In this paper an electronic voting system using SMS is presented but to care of the remaining 212,000,000 voter that is 3.03% of the voter will use the traditional electronic voting machine as it is. Considering the significant horde of versatile clients we created changed democratic machine which underpins both electronic democratic machine and SMS based democratic.. We can abuse existing versatile confirmation system and furnish improve voter verification with portability while keeping up voter security. Now day's additional problem is of declaring the result of voting, so to declare result normally 8-10 days will be taken. Right now of casting a ballot machine is prime inquiry and exceptionally enormous cost paid for this.. In our modified voting machine we can declare result within 1hr of casting a ballot and furthermore the democratic outcome send to all enrolled portable number.

III. PROPOSED WORK

We have to get the data of the voter. So we need some current database where the voter's data is put away. Voter's information can be gathered from the AADHAR card database. So for casting a ballot the individual needs to arrive at the democratic corner, in the wake of arriving at the stall there is iris scanner the voter's eye is looked over the iris scanner. At that point framework contrasts filtered picture and brought together put away data this is called as sign in process. Once iris is recognized successfully the complete detail of voter is sent inside to give vote. When the voter iris is checked then in the database it is get refreshed that this specific voter has given vote.

ADVANTAGES OF PROPOSED SYSTEM:

The overall deep learning based iris recognition accuracy is high than traditional model of machine learning.
The processing speed is high so it's has less computational time.

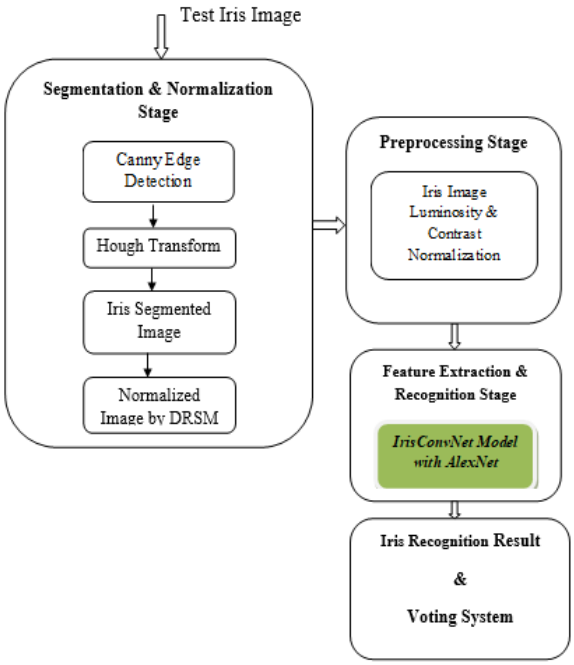

Fig. 1 Tentative system Design

IV. IMPLEMENTATION

A. Image Acquisition:

Picture obtaining in picture preparing can be extensively characterized as the activity of recovering a picture from some source, typically an equipment based source, so it very well may be gone through whatever processes need to occur afterward.
Performing picture obtaining in picture preparing is consistently the initial phase in the work process arrangement in light of the fact that, without a picture, no handling is conceivable. The picture that is procured is totally natural and is the aftereffect of whatever equipment was utilized to create it, which can be significant in certain fields to have a consistent baseline from which to work.
Test iris images are acquired from gallery.

B. Iris Segmentation & Normalization:

Next, a segmentation algorithm is used, which would localise the iris region from an eye image and isolate eyelid, eyelash and reflection areas.
Automatic segmentation is achieved using the circular Hough transform for localising the iris and pupil regions, and the linear Hough transform for localising occluding eyelids. Thresholding is also employed for isolating eyelashes and reflections.
Third, the segmented iris region is normalised to eliminate dimensional inconsistencies between iris regions.
This is achieved by implementing a version of Daugman's rubber sheet model, where the iris is modelled as a flexible rubber sheet, which is unwrapped into a rectangular block with constant polar dimensions.

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B. Preprocessing:

The third stage of iris recognition is contrast normalization.

After that image resizing process (227*227) is implemented.

In that, iris image contrast is normalized by adaptive histogram equalization (AHE) process.

D. Feature Extraction & Recognition:

After the preprocessing, feature extraction and recognition is implemented in normalized data's.
Proposed method shows how to use transfer learning to retrain AlexNet, a pretrained convolutional neural network, to recognize a new set of images (Normalized biometric). Move learning is regularly utilized in profound learning applications. Fine-tuning a network with transfer learning is usually much faster and easier than training a network with randomly initialized weights from scratch.

V. ALGORITHMS

A. Canny edge detection and hough transfrom

The **Canny edge detector** is an edge detection operator that uses a multi-stage algorithm to detect a wide range of edges in images
the Canny edge detection algorithm is composed of 5 steps:

1. Noise reduction;
2. Gradient calculation;
3. Non-maximum suppression;
4. Double threshold;
5. Edge Tracking by Hysteresis.

The Hough transform is a feature extraction technique used in image analysis the purpose of the technique is to find imperfect instances of objects within a certain class of shapes by a voting procedure. This democratic system is done in a parameter space, from which item up-and-comers are

acquired as nearby maxima in a purported gatherer space that is unequivocally built by the algorithm for computing the Hough transform.
The Hough transform has been extended to identifying positions 0f arbitrary shapes, most commonly circles or ellipses

B. Daugman's rubber sheet

Daugman's rubber sheet is used for iris normalization

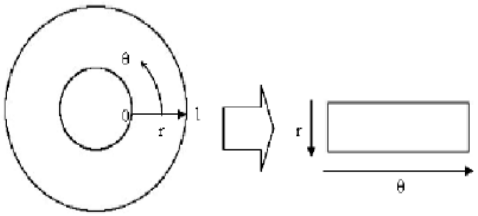

Fig.Implementation of Daugman's rubber sheet model

C. ALEXNET CNN

CNN is used for iris recognition.The system had a fundamentally the same as engineering as LeNet yet was more profound, with more channels per layer, and with stacked convolutional layers. It comprised 11x11, 5x5,3x3, convolutions, max pooling, dropout, information increase, ReLU actuations, SGD with force. It appended ReLU initiations after each convolutional and completely associated layer.

VI. Results discussion

Some of the classification models are

- Image Acquisation
- segmenition
- Normalisation
- Preprocessing
- Iris recognition & Voting System

By performing the classification on five models, it will help in visualizing the performance of all five models by output a graph;it will be easier to select which model gives high accuracy.

There are many models for classification iris, which were given 96% of the accuracy in iris detection by using a numerical database. But in the CNN model, we used an image processing technique which able to give a more than 96% accuracy in the iris detection.

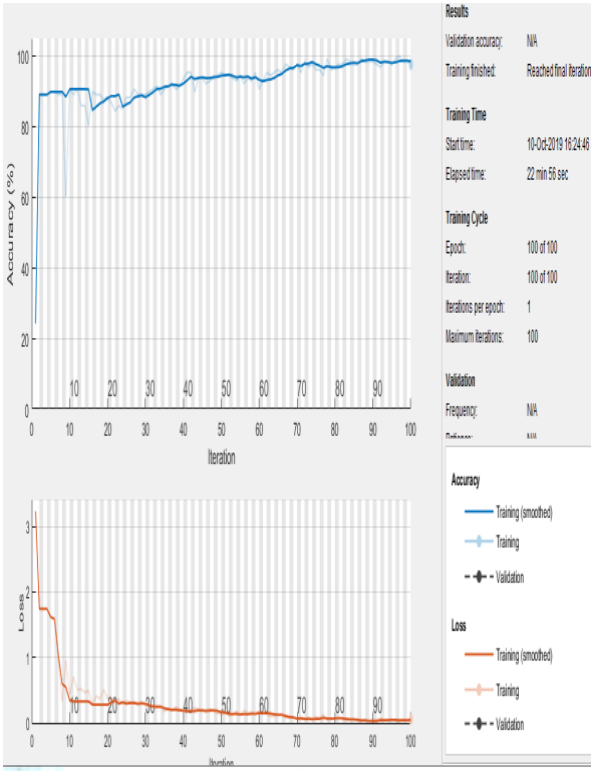

Fig. Generate of trained model network

VII. Conclusion

This paper has presented an iris recognition system, in which recognition was done using canny edge detection, Hough transform & AlexNet CNN. The database should be refreshed each year or before political decision with the goal that new qualified residents might be selected and the individuals who are dead are expelled from the voter list.. In this paper the Security of the voter is discussed and in general and the focus is on making the voting system more robust and reliable by eliminating dummy voters. Additionally we have talked about Hough change and Daugman's Algorithm based division procedure figured out how to effectively fragment the iris district, AlexNet CNN based component extraction and acknowledgment, which compares to a triumph pace of around 95%. This democratic framework encourages everyone to cast their votes with no issue. Voting application will increase the percentage of voting. Manual counting is not required. So by this we will get the very prominent, clear and fast result.By utilizing this recently evolved framework we can beat numerous issues of existing framework. This framework is more productive than the current one.

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