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Deep Learning Based Iris Recognition for Voting System

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ABSTRACT

In this project, we are analysing an individual's iris and storing it in database by giving ID. If an individual want to vote, at that point their iris is distinguished and this matched picture is contrasted with the picture in a database. When the iris matches, then the person is allowed to vote. The current voting system is not reliable, 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. We consider the Convolutional Neural Network transfer learning model for iris images features extraction and recognition, which results in outflanking coordinating exactness more than a few traditional and best in class calculations for iris acknowledgment.

I INTRODUCTION

A primary use of biometric processes is the identification of specific types of physical characteristics. Various recognition techniques are commonly specified for this purpose, including real fingerprint, iris processes and speech recognition. The main focus of biometry is on technical and technological areas related to physical examination and body measurements. Real biometric security systems, which have gained real importance in all countries, serve as the basis for other authentication systems. Based on this process and factors, the system used shows adequate efficacy and the best performance. The iris method is the only way to provide adequate security measures to ensure complete uniqueness of the system and strong privacy.

II LITERATURE REVIEW

Today, iris recognition becomes a very important factor in making systems more secure. Numerous articles have been published in the field of iris recognition over the past decade, and a significant number of them have been reviewed in this study. Iris recognition is achieved using the Hough transform, Daugman, or a combination of the two. However, iris recognition is primarily done by neural networks. Other techniques are also used for classification.

III EXISTING METHOD

Current iris recognition systems are specifically based on division. Segmentation is used to find the exact position of the iris in the eye, and it must be done with great precision and accuracy to eliminate the eyelids, eyelashes, reflexes, and pupillary chatter. in the iris region. In it they use two segmentation methods, namely Daugman algorithm and Hough transform.

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LIMITATIONS OF EXISTING METHOD

- It may give false output because of using only the division technique.
- Inaccurate output because we are using division technique there might be a chance of getting same featured images by using division.

IV PROPOSED METHOD

This method we used for getting accurate output. The "convolution neural network (CNN)" is a specific type of deep learning-based algorithm. This algorithm has been taken as an appropriate input image, an important attribute that is learnable weights with respect to the proper biasing system to the different types of objects. For this purpose, this particular system is very much effective to show the actual difference in the working process in each case

SOFTWARE REQUIRED

Python

There is a huge community behind Python as a language. Any issues you encounter can be easily resolved by visiting Stack Overflow. Python is one of the leading standards. Python has a wealth of powerful tools geared toward scientific computing. Packages such as NumPy, Pandas and SciPy Area Unit are freely available and well documented. Such packages greatly reduce and modify the code required to create a given program. This makes iterations faster.

Python as a language is permissive, allowing programs that look like pseudocode. This is useful if you need to apply and test the pseudocode provided in the tutorial paper. In Python, this step can be quite straightforward. However, Python is not without bugs. The language is dynamically written and the package is famous for duck writing. This can be frustrating if, for example, your packaging technique returns what looks like an array instead of the actual array. On top of that, the standard Python documentation doesn't clearly state the return types of methods, which can lead to a lot of trial-and-error testing that doesn't happen in powerful programming languages. This is an issue that makes learning to use alternative Python packages or libraries more difficult than it otherwise is.

LIBRARIES USED

- Numpy
- Keras
- OpenCV
- Tensor Flow

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BLOCK DIAGRAM OF PROPOSED METHOD

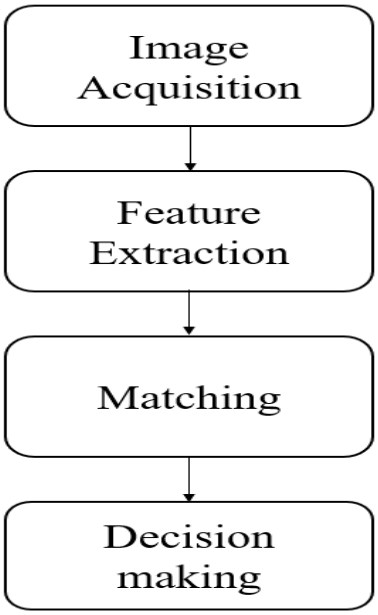

Fig: Design Model

- **Image acquisition**

Image acquisition deals with capturing sequence of iris images from the subject using cameras and sensors. These images should clearly show the entire eye especially iris and pupil part, and then some preprocessing operation may be applied to enhance the quality of image e.g., histogram equalization, filtering noise removal etc.

Iris portrait can't be gain via archetypal camera while it is small in dimension. The aspect of iris can't obvious in emblematic camera. There be moreover light reflection present whilst infectious iris depiction via normal camera. In this method, it is solid to gain enormous portrait. We be utilize "CASIA Iris Image Database" as well as some iris portrait taken via versatile pro portrait procurement.

- **Feature Extraction**

The next step of iris recognition is to isolate the iris portion from the eye image, called segmentation. It is a technique required to isolate and exclude the artifacts as well as locating the circular iris region. The inner and the outer boundaries of the iris are calculated. Segmentation of iris depends on the quality of the eye.

- **Matching**

For coordinate, we utilize the hamming partition. Hamming partition of two format is resolute via touching one outline left as well as right piece perceptive as well as assorted Hamming partition esteem be resolute as of progressive activities. One shift is characterizing as one move left, plus one move right of a allusion format.

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- **Decision Making**

Iris recognition is the process o recognizing a person by analyzing the random pattern of the iris. A person is identified by the iris which is the part of the eye using pattern matching or image processing. Iris verification verifies the identity of a person while iris identification establishes the identity of the person.

CNN MODEL ARCHITECTURE:

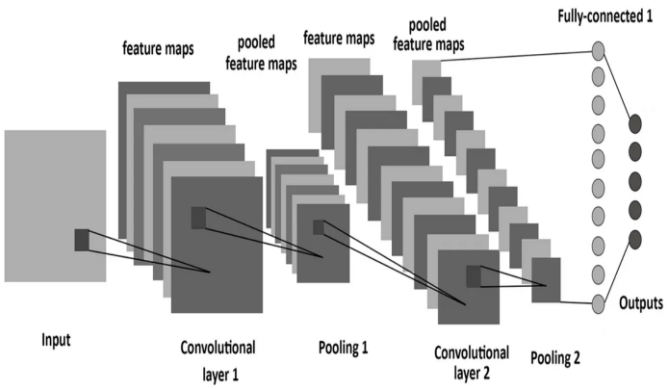

Fig: CNN model

In the convolutional layer, number of filters is specified. It performs the convolution operation on the original image and generates a feature map. CNN can be used for the computational model creation that works on the unstructured image inputs and converts to output labels of the corresponding classification.

They belong to the category of multi-layer neural networks which can be trained to learn the required features for classification purposes. Less pre-processing is required in comparison to traditional approaches and automatic feature extraction is performed for better performance.

Convolutional Layer:- This layer is the first layer that is used to extract the various features from the input images. In this layer, the mathematical operation of convolution is performed between the input image and a filter of a particular size MxM. By sliding the filter over the input image, the dot product is taken between the filter and the parts of the input image with respect to the size of the filter (MxM).

ReLU:- The Rectified Linear Function (ReLU) performs the maximum function to convert the negative values to zero without changing the positive ones and generate a rectified feature map. Relu performs faster compared to these two nonlinear activation functions (Sigma, tanh), and it is useful to wipe off the gradient problem in the back propagation at the time of training and in multi-layer neural networks.

Pooling Layer:- In most cases, a Convolutional Layer is followed by a Pooling Layer. The primary aim of this layer is to decrease the size of the convolved feature map to reduce computational costs. This is performed by decreasing the connections between layers and independently operating on each feature map. Depending upon the method used, there are several types of Pooling operations. It basically summarizes the features generated by a convolution layer.

Fully Connected Layer:- The Fully Connected (FC) layer consists of the weights and biases along with the

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neurons and is used to connect the neurons between two different layers. These layers are usually placed before the output layer and form the last few layers of a CNN Architecture.

RESULTS

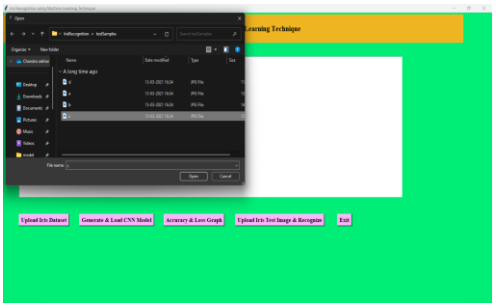

Fig : Sample iris for testing

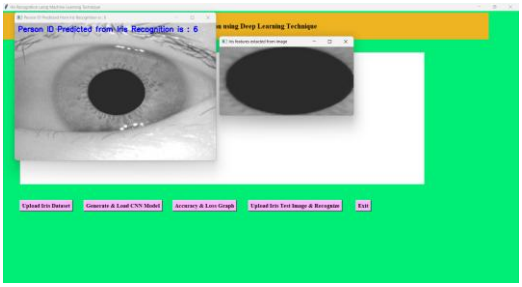

Fig : Predicted Image

V CONCLUSION

By using the proposed technique in deep learning, the iris recognition is more accurate. And this method is efficient compared to existing techniques of iris recognition. The proposed method performed iris recognition and gives better security for voting system.

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