

Facial Recognition Software

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Abstract: Any new software being developed today should satisfy a few important criteria. The software should provide security, be reliable and have feasible implementation. Facial recognition is an important part of our everyday life in today's world. We use facial recognition for a wide variety of tasks such as opening our phones, confirming payments through online payment modes, etc. However facial recognition has many other implementations in areas of important aspect to the society which will make our day-to-day activities easier. It will also help in increasing the efficiency in the identification process. The technologies available to implement facial recognition include the OpenCV library and methodology to implement those using Python. For face detection, Haar-Cascades were used and for face recognition Eigenfaces, Fisherfaces and Local binary pattern histograms were used. The results are shown by including screen-shots. The report is concluded with the authors' opinion on the project and possible applications.

Keywords —Reliable, efficiency, identification, opencv.

I. INTRODUCTION

Access codes for homes, financial institution account and pc structures often use Pin's for identity and protection clearances. Using the proper PIN gets admission to, but the consumer of the PIN isn't established. Whilst the credit and ATM cards are lost or stolen, an unauthorized person can often come up with the suitable private codes. Face recognition technology may remedy this trouble since a face is undeniably linked to its owner count on in case of identical twins. Face recognition is a research area with a wide range of applications on real world along with information safety and get right of entry to control. Many face popularity algorithms are designed to work well aligned, well illuminated and frontal face pose photograph. Small version of face size and orientation can be affected the output. Similarly illumination performs a critical function in accuracy level of the software. There are numerous systems already however lots of them have drawbacks which makes implementation difficult.

II. RELATED WORK

Jeffrey S et al has presented a paper on facial recognition the use of thermal imaging. Here, he has claimed to use

thermal imaging for identification using face recognition software. The advantages of the proposed device are that it could be used to avoid inconsistencies due to attempted cover or eye glasses. however the implementation of proposed system will be steeply-priced due to requirement of thermal imaging digital camera[1].

Xianghua Fan et al has advised to apply Opencv and a modified AdaBoost algorithm for the method of facial recognition. Within the proposed system real time face detection can also be carried out the usage of two strategies of timer and dual-thread. The usage of the dual thread approach for identification is less complicated, quicker and more accurate.[2]

Madhuram et al have offered a system for facial recognition the usage of Opencv. The proposed system includes three modules and they're detection module, training module and recognition module. Linear Discriminate evaluation (LDA) is used to find linear combination of features that's used to pick out the variations between the two items or faces[3]

Florian Schroff et al have presented the paper on facial recognition in which they've provided a system called FaceNet. FaceNet immediately learns a mapping from face images to a compact Euclidean space wherein distances

without delay correspond to a degree of face similarity. The proposed approach uses a deep convolutional network trained to immediately optimize the embedding. The machine has a excessive performance level as it handiest makes use of 128 bytes per face.[4]

Brandon Amos et al have presented a paper for facial recognition using of internet of things (IOT). The paper shows the usage of digital camera telephones for facial recognition. The system if implemented could be economically efficient. They have created OpenFace that's a a general purpose library for face recognition. OpenFace provides a better rate of identification and is compatible with mobile phone cameras.[5]

III. METHODOLOGY

Biometric authentication and their template protection are increasing day by day over the past decade with challenging requirement Automated Secured Personal Authentication System. The motive behind on this call for the alternative of old computerized private identity gear by using new one. The old automated personal identification gear use conventional processes along with private identity wide variety (PIN), Login identity, identity card, password and many others. to verify the cognizance of a person, are now not considered as credible good enough to gratify the security problem for character identification machine. A biometric scheme can provide automated recognition of someone depending on a few precise trait. But there are various spread out demanding situations in the current researches in biometric private authentication. Among those, foremost demanding situations of iris reputation structures are related to Iris Template protection and Iris recognition performance. Biometric being a quintessential part of human body, loss of one's biometric corresponds to lack of his/her identification. Security of iris templates is one of the most crucial problems in any biometric authentication system.

The Facial Recognition software can be used to identify faces and store the image and name it. This is done using Opencv with pre taught neural network. OpenCV has the advantage of being a multi-platform framework; it supports both Windows and Linux, and more recently, Mac OS X. OpenCV's functionality that will be used for facial recognition is contained within several modules. OpenCV uses a type of face detector called a Haar Cascade classifier. Given an image, which can come from a file or from live video, the face detector examines each image location and classifies it as "Face" or "Not Face." Classification assumes a fixed scale for the face, say 50x50 pixels. Since faces in an image might be smaller or larger than this the classifier runs over the image several times, to search for faces across a range of scales.

The steps involved in identifying the face from image or video and storing them future use us as follows:

1. Detect/identify faces in an image/video (using a face detection model)
2. Predict face poses/landmarks (for the faces identified in step 1)
3. Using data from step 2 and the actual image, calculate face encodings (numbers that describe the face)
4. Compare the face encodings of known faces with those from test images to tell who is in the picture.

IV. RESULTS

The results from running the software on various images and videos are as follows:

Here we can see the software runs efficiently and identifies the face and recognizes the person from the data already provided.



Figure 4.1 O/P of Web camera Recognition

While running the software on a video clip, it produces results for each frame and successfully identifies the faces from the data already provided to it.

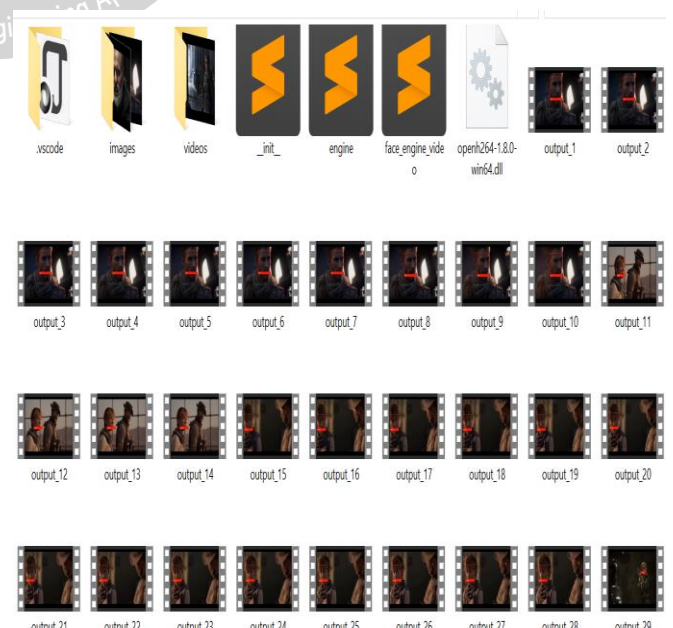


Figure 4.2 O/P of Recognition from saved video.

V. CONCLUSIONS

Face recognition systems are beneficial in regulation enforcement and justice answers with the aid of staying one step in advance of the world's ever-advancing criminals. This includes acclaimed CABS automated arrest and booking system and the child base safety that's a software solution for international law enforcement organizations to help defend and recover missing and sexually exploited children, mainly as it relates to child pornography. It is also useful in Homeland protection which includes the whole lot from stopping terrorists from boarding aircraft, to defensive essential infrastructure from assault or tampering (e.g. dams, bridges, water reservoirs, electricity vegetation, and so forth.), to the identification of known terrorists. Face recognition software program, can enhance the security of the financial services industry, saving the banks money and time each through a discount of fraud case and the management prices of managing forgotten passwords. Moreover, biometric-based access control devices can protect vaults, teller areas, and protection deposit containers to shield against theft. the usage of biometrics also can make certain that personal information stays exclusive even as deterring identity theft, mainly as it relates to ATM terminals and card-no longer-present e-trade transactions. It permits capturing, archiving, and retrieving identifying traits as tattoos, marks, or scars. it may also analyze scenes from either streaming or archived video, "searching" for out-of-the-normal occurrences, the presence of certain vehicles, particular faces, and many others. This is useful and might save massive time and money to those folks who spend hours, days, or weeks tracking video streams (i.e. examining a bank's protection in a criminal investigation).

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