

Face Detection system

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Abstract – This research papers are given an ideal way of detect of human face using python and OpenCV which is part of deep learning. This report will contain the ways in which deep learning is an important part of computer science field can be used to determine the face using several libraries in OpenCV along with python. This report will introduce a system in which will help in the detecting the human face in real time. This implementation can be used in some popular platforms in machines and smartphones, and several software applications.

Keywords: Python, OpenCV, Deep Learning, face detection, etc.....

1. INTRODUCTION

Face detection is the method it is used to identify the identity of a human being using one's individual face. Some type of systems can be used in photos, videos, or in real time machines. The main objective of this article is providing a simpler and easy method in the machine technology. the face recognition system are used provide security in the various platforms and the several areas. With the help of this technology one can easily detect the face by the help of dataset in similar matching appearance of a person. The method in which with the help of OpenCV and python in deep learning is the most effective way to detect the face of the person. This technique is useful in many fields and platforms such as the colleges, railway, for security, schools, and universities, airlines, banking, online web applications, and gaming applications, and it is also used for the military purpose to identify the terrorist etc. this system are uses python algorithm through which the detection and recognition of face is very easy and effective. the face recognition system are provide the best way to detect the face of the person and identify the person and this technology are used to provides the security of the platforms and various smart devices like a phone, laptop, tablet etc..

1.1 Motivation

The most useful area in which face detection is important is the biometrics that is used for authentication process which makes the work easier. Face detection are one of the important useful technologies or systems in which it has the potential to perform tasks such as to have records provided in by the dataset in many areas such as the school and colleges attendance systems, it can also be useful in catching the thief or the terrorist, and can be useful in the security of peoples and the much-needed security areas and borders in the country. Face recognition can be used by government to find missing persons, and verify the voter id, adhar card it is used to verifying the id of the persons find the population or census, immigration process, and useful in provides the security over internet are used to scams protecting Ecommerce and highly used in the healthcare range and medicine. This brings in a very high demand or a real time face recognition system for several uses for people and government.

This system is used to provide the security of the human being because this system are detect the face of the terrorist and also capture the activity of the terrorist.

Providing such excellent systems there would be ease in several activities.

1.2 Problem Statement

The main aim or objective of this paper is to provides or develop a systems that will use the camera of the computer or the system that would detect and recognizes the person's face or the face of the individual using the tool in OpenCV called as the Open Face and python programming language is the part of the deep learning domain. the face recognition system are detect the face of the person using opencv. this system are used the identify the identity of the person.

2. Literature survey

This section is an overview of the major techniques used in the face detection system that apply to the front of the human being. The methods are include some neural networks, hidden Markov model, face matching done geometrically and template matching.

Eigenface is one of the useful methods in the face recognition and detection which are called as the principle components in mathematical terms. The eigenvectors are used to represent different amounts of the variations in the faces. the eigenvectors is the best way to recognize the face of the human being. this technique are apply front of the human being and identify or recognize the person.

Neural networks are used in the face recognition and detection systems. And ANN (artificial neural network)

Was also useful in the face recognition and identify the person which contained a single layer Which shows compatibility in crucial face recognition systems. The face verification is done by using a double layer of WISARD in the neural networks. face recognition system are used to detect the face of the person by using the neural network and this system is used to identify the person.

Graph matching is other option for face recognition. The object as well as the face recognition is formulated using graph matching performed by optimization of a matching function. Hidden Markov Models is the method useful in stochastic modeling of nonstationary vector time series based on HMM model is applied to the human face recognition and the faces gets divided into the many parts ears, nose, eye etc. The face recognition are matching the face to relevant model of the dataset

The geometrical feature matching is the method which is based on the geometrical shapes of the face. The geometrical face configuration has the adequate dataset for face detection and recognition system. This is one of the useful method of the face recognition and detection. This system apparently gives satisfactory results.

Template matching is one of the best techniques through which is used to the test image is represented as a two-dimensional array of values which can be compared using of the Euclidean distance with single template represent the whole face. This method can be used more than one face template from different points of view to represents an individual face.

Use Cases of Detection Systems

Face detection systems are used in the several areas, and many new innovative systems are make on top of recognition systems.

There are a few used cases :

- Finding Missing Person
- Identifying accounts on social media
- Recognizing Drivers in Cars
- School Attendance System
- there are some methods and algorithms are implement in the facial recognition systems depending on the performance and accuracy.

3. Methodologies

In this section, we are implement the face recognition by using OpenCV and Python. Firstly check the libraries we will required and how to install them:

- dlib
- face recognition
- openCV

OpenCV library are used to doing processing of the image and video and this library is used analysis of the image and video and those analysis term is , like face detection, photo editing, license plate reading and this library is also used in advanced robotic vision, optical character recognition, and a many more.

The dlib library, contains our implementation of “deep metric learning” and dlib library is maintained by davis king which is used for the actual recognition process and it is also used to construct our face embeddings and recognize the face.

The face_recognition library are wraps around dlib’s facial recognition functionality and this library is create by Adam Geitgey, and this library are easy to work with and we will be using this in our code. Remember to firstly install dlib library before you install face_recognition library.

Python is a very powerful programming languages and one of the programming languages that are used in the all over the world and python give the best results in the face recognition and detection systems. face recognition and detection becomes very easy with the help of the python programming language and OpenCV python programming language are also easy to implement that’s why face recognition and detection becomes easy.

3.2 Need of an automated system

Due to the rising need for the systems which can help in the areas such as supervision as well as security this kind of individual authentication can no longer be done using simple handmade methods hence there is a emerging need of the automated system that can easily improve the fault and process of the human face recognition. When the work is done by machine it is performs the tasks efficiency in very less duration of time and cuts off the major mistakes occurred by humans. A real time GUI based face recognition system make can ease this work of face detection and can be achieved in various ways.

3.3 Graphical User Interface

The graphical user interface (GUI) will allowed the inputs from the user ends a kind of interaction with the system. it is the platform used to interact with the system and GUI’s are used in some platform like a media players, mobile, games and many others. and in the graphical user interface We can design the progressive behaviour of the GUI in any of the software application as well as programming in the areas of the human computer interaction. The GUI for this project will be in encompassing manner based on the training and the testing phase which in turn will allow the capture and train of the image.

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The minimum requirements for the software would be python along with OpenCV and the required dataset. The minimum requirements for the hardware would be intel i3 or any processor above it and 4 core CPU. Operating systems of windows 10 will be substantial and random access memory 8GB required. From the user end a computer or laptop active internet connection and a scanner optional.

4. Proposed Arrangement for system design

In this system firstly we will create the datasets. And in the created datasets register the face of the people to recognized and detect the face from the image of register people and extract the facial In this system first we will have to create the features from the detected face . The input are taken from the dataset which will be received in the “encodings.py” . There will be

accurate formatting in the system in which the face embedding for each face will be that's why face detection system is easily recognize the the face of the person. Secondly a file "recognize_faces_images.py" will contain all the methods and the techniques for the process of identification of the face of the person from the given image of the dataset. and the files are execute by the using the python command "python recognize_faces_image.py-encodings". and in the recognition system We can turn and manage the size of the image for closeness with the goal for getting the required output. Therecognition system are provide the best quality image after recognize the face of the person and getting the desired output. and the system in the recognition system will be increase the outcome and result by using the present classifier along with openCV.

5. Advantages and Disadvantages

There are many advantages of the facerecognition system include it is provide the faster processing and automated capture the face of the persons, and identify the identity of the persons breach of privacy, it is store the large amount of the data , best results, enhanced security, employees at corporate offices, big companies, industries, real time face recognition system are used to security purpose in the school and colleges, bank, atm and the border area of the country. and real time face recognition system are used to take the attendance in the school and colleges and recognition system are used to identification and authenticate the owner of the mobile device and the some other device and the many more in day to day life.

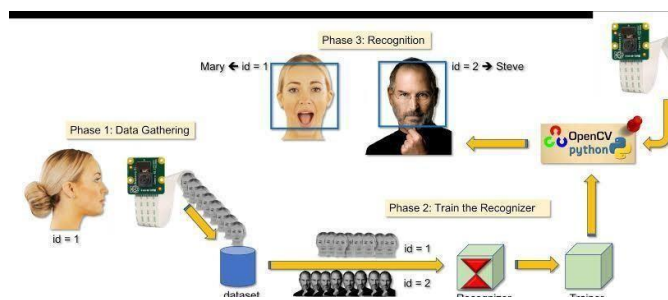


Figure 1: face recognition system design using python and OpenCV.

There are some disadvantage in the face recognition system include the high costing setup of the recognition system , or the funding, in the system are required the good cameras of the high quality pixels , and the poor image quality may limit the effectiveness of this system, and in the system small image are very difficult to recognize , Face angles can limit the face recognition reliability, in the face recognition system are required large amount of the data to effectively work.

6. Conclusions

Face recognition systems are currently associated with many top technological companies and industries making the work of face recognition easier. The use of python programming and OpenCV makes it an easier and handy tool or system which can be made by anyone according to their requirement. The proposed system discussed in this project will be helpful for many as it is user friendly and cost_ efficient system. Hence by the use of python and OpenCV the face recognition system can be designed for various purposes and in the face recognition system are used the openCV and python.

7. Acknowledgement

We would like to sincerely thank our professor Dr. Shakun Garg sir for guiding us throughout this project work also would like to thank our other faculty members from the Information Technology department at IIMT College of Engineering for allowing us to perform our project work.

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