

Face Detection using Python and OpenCV

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ABSTRACT - This research paper provides an excellent way to find and see a person's face using OpenCV and Python which is a part of in-depth study. This report contains ways in which in-depth study can be used as an integral part of the computer science industry to gain face using several libraries in OpenCV and python. This report will contain the proposed program that will assist in locating a person's face in real time. This implementation can be applied to a variety of device and smartphone platforms, as well as several software applications.

Key Words: Python, OpenCV, Advanced Reading, Face Detection, etc.

I. INTRODUCTION

Face recognition is a method by which a person's identity can be identified using a single face. Such systems can be used in photos, videos, or real-time machines. The purpose of this article is to provide a simple and straightforward approach to machine technology. With the help of such technology one can easily see faces with the help of a database on the same human-like look. The way in which with the help of python and OpenCV in deep reading is the most effective way to get a human face. This method is useful in many fields such as military, security, schools, colleges and universities, airlines, banks, online web applications, games etc. this program uses a powerful python algorithm where face detection and recognition is very easy and effective.

PROBLEM STATEMENT

The main purpose or objective of this paper is to provide or develop a program that will use a computer camera or program that will be able to detect and Recognise a person's face or the face of a person using an OpenCV tool called Open Face, and the programming language of the python in a deep learning environment.

MOTIVATION

A very useful area where face recognition

is important is biometrics used in the verification process which makes the task much easier. Face recognition is one of the most widely used technologies or systems where the ability to perform tasks such as having databases provided by databases in many areas such as school and college programs, may also be helpful in apprehending thieves or terrorists, Face recognition can be used by the government to verify voter lists, missing people, demographics, censorship, and provide protection from online scams that protect Ecommerce and are widely used in the medical and healthcare sector. This brings with it a great deal of need or a real-time face-to-face system of multi-person use by governments.

II. LITERATURE SURVEY

This section is a basic overview of the major techniques used in the facial recognition system that are most effective on a person's forearm. Techniques include neural networks, Markov's hidden model, geometric face-to-face comparisons and template matching.

Eigenface is one of the most widely used methods of facial recognition and detection so-called goal-oriented components. Eigenvectors are instructed to represent different amounts of surface variability. Neural networks are widely used in face recognition and detection systems. ANN (artificial neural network).

It was used in face recognition consisting of a single layer that shows adaptability to important facial recognition systems. Facial verification is done using a double WISARD layer on neural networks.

Graph matching is another option for face recognition. An object and a facial recognition can be created using graph matching to prepare for the same task.

Markov Hidden Models is a non-permanent vector series based on the HMM model used to identify a person's face where the face is divided into parts such as eyes, nose, ears, etc. % is correct as it always provides a good and correct

choice for face detection with a database. Or else the appropriate model reflects facial identity.

Geometric matching is a method based on the geometric shapes of the face. Geometric face correction has enough data for face detection.

Face detection is a computer technology that determines the location and size of human face in arbitrary (digital) image. The facial features are detected and any other objects like trees, buildings and bodies etc are ignored from the digital image.

III. METHODOLOGIES

The concept of OpenCV is presented by Gary Bradski who had the power to create a multi-level framework. OpenCV has a lot of valuable skills and resources from scratch. OpenCV helps to identify a person's front face and creates XML documents for a few places as body parts.

In-depth learning recently emerged in the process of awareness programs. So in-depth learning and facial recognition together serve as deep matrix learning programs. In short the in-depth learning in face recognition and recognition will be most effective in two areas the first is to accept the embedded image combined with any other relevant image and the second is to provide the best effects or image effects. We will be using a dlib face recognition framework which can be an easy way to schedule a face test. The two most important libraries used in the system are dlib and face_recognition.

Python being the most powerful programming languages and one of the most widely used editing languages worldwide has proven to provide the best results for face recognition and discovery systems. Together face recognition and detection becomes much easier and fruitful with the help of Python and OpenCV editing language.

GRAPHICAL USER INTERFACE

A Graphical User Interface (GUI) is a platform that will allow input from the user to complete the type of interaction.

GUIs used for mobile phones, media players, games and much more. We can design visual and behavioral GUI templates in any software program and configure personal computer environments. The GUI of this project will be based on the training and testing phase that will allow for photography and image training.

Minimum software requirements will be python and OpenCV as well as the required database. Minor hardware requirements can be intel i3 with any processor above and 4 core CPU.

Windows 10 operating systems will suffice and achieve the required 8GB of memory. From the end of the user's computer or laptop computer an active internet connection and a scanner of your choice.

NEED OF AN AUTOMATED SYSTEM

Due to the growing need for systems that can help in areas such as surveillance and security this type of individual verification can no longer be done using simple manual methods which is why there is a growing need for automated systems that can easily fix errors and process human face recognition.

When work is done mechanically it can perform tasks efficiently in a very short time and cut down on major human mistakes. A real-time face-based GUI system can streamline this face detection function and can be accessed in a variety of ways.

IV. PROPOSED ARRANGEMENT FOR THE SYSTEM DESIGN

In order to create this system first we will need to create databases. When the image quality becomes attractive, different processes will take place in the face recognition process. The input will be taken from the database that will be found in "encodings.py". There will be an accurate formatting in the system where each face-to-face embedding will take place. Secondly the file "recognize_faces_images.py" will contain all the necessary methods and techniques for identifying a person's face from a given database image.

The provided file will be used with the python command "python recognize_faces_image.py-encodings". We can resize or resize the image to zoom in to get the output we want. The current section and OpenCV libraries will enhance the result or results in the face recognition system.

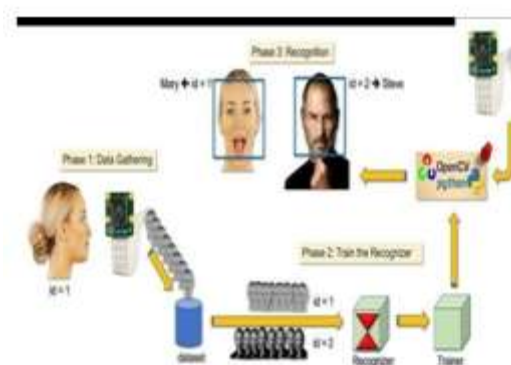


Figure 1: Face recognition system design using python and OpenCV.

V. ADVANTAGES AND DISADVANTAGES

The benefits of a face recognition system include faster processing, automatic ownership, privacy breach, greater data retention, better results, improved security, real-time facial recognition of students in schools and colleges, staff in corporate offices, unlocking smartphones and much more in everyday life.

A few problems with this system include cost, or subsidy, excellent high-definition cameras are required, poor image quality may limit the performance of this system, image size will matter because it is difficult to see faces in small images. Face angles can limit the reliability of facial recognition, greater storage is required for this system to work properly.

VI. CONCLUSION

Face recognition systems are currently associated with many high-tech companies and industries that make face recognition easier. The use of the Python and OpenCV program makes it a simple and useful tool or program that anyone can make for their needs. The proposed program discussed in this project will be useful to many as it is easy to use and effective. So with the use of python and OpenCV a face recognition system can be built for a variety of purposes.

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