

FACE DETECTION USING PYTHON*

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ABSTRACT

This research paper gives an ideal way in order to detect as well as recognize human face using OpenCV, and python 3.6 or later which is part of deep learning. This report contains the ways in which deep learning which is an important part of computer science field can be used to determine the face using several libraries in OpenCV along with python 3.6. This report will also contains a proposed system which will help us in order to detect the human face in real time. This implementation can be used at various operating Systems like windows, Linux and MacOS.

KEYWORDS

Python 3.6 , OpenCV, Deep Learning, Face detection.

1. Introduction

Face recognition is that the technique during which the identity of a human being are often identified using ones individual face. Such quite systems are often utilized in photos, videos, or in real time machines. The objective of this text is to supply a simpler and easy method in machine technology. With the help of such a technology one can easily detect the face by the help of dataset in similar matching appearance of a person[1]. The tactic during which with the assistance of python and OpenCV in deep learning is the most efficient way to detect the face of the person. We can also use this method in many areas such as the military, for security, schools, colleges and universities, banking, online web applications, airlines, gaming etc[1]. This system uses powerful python algorithm through which the detection and recognition of face is extremely easy and efficient.

2. Objectives

The objective of face recognition is to find out the incoming image and also to find a series of data of the same face in a set of training images in a database. In this we find out the great

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difficulty in order to ensure that this process is carried out in the real-time.

The facial recognition process that can perform two types of variants depending on when it is performed:

1. The one in which, for the first time, a facial recognition system addresses a face to register it and associate it with an identity, in such a way that it is recorded in the system. This process is also known as digital onboarding with facial recognition
2. The variant in which the user is **authenticated**, prior to being registered. In this process, the incoming data from the camera is crossed with the existing data in the database.

3. Methodologies

Scientists put forward the concept of Python OpenCV that had the ability in order to perform on a multi-level framework. OpenCV has a number of significant abilities as well as utilities which appear from the outset. The OpenCV helps us in recognizing the frontal face of the person who comes in front of it. As we know that the Deep learning evolves the process of the recognition of the system for face.

Hence we can say that the deep learning along with the face recognition together help us a lot. In short we can say that the deep learning in face detection and recognition will definitely work on two fields: one is being accepting input image solidary and the other one is to give the best outputs or the results of the image of the picture. The two main significant libraries used in the system are `dlib`, `tkinter` and `face_recognition`.

Python is being a very powerful and effective programming language and one of the best programming languages in order to give best results in the face recognition and detection systems. Together face recognition and detection becomes very easy and fruitful with the help of the Python programming language and OpenCV.

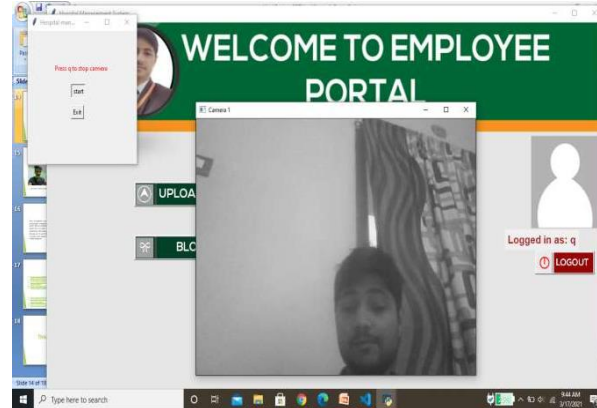


Fig : Face Detection

4. Proposed Arrangement for system design

Nowadays advancement of man-made brainpower is effectively creating; they open up tremendous potential outcomes before us. Investigation, gauging, detection went to another level with the utilization of man-made reasoning advancements. As of late, an incredibly encouraging field of research is Computer vision. Face detection is a phase where identifying the faces from the images or video sources. It very well may be utilized for remote distinguishing proof administrations for security in regions, for example, banking, transportation, law requirement, and electrical businesses. Despite huge varieties in visual upgrades because of evolving condition, maturing, and interruptions like whiskers, glasses, and haircut changes, this capacity is extremely powerful. In this research paper we proposed a numerical model along with computational model of face acknowledgment which is quick sensibly and precise.

The goal of this face detection is to determine if any faces in the image or video[2] are present in front of it. Human faces are very much difficult to model as there are many variables in it that can change for example facial expression their orientation their lighting conditions and their partial occlusions such as sunglasses, scarf, mask etc.

5. Advantages and Disadvantages

Face recognition uses focus on verification or authentication. This technology is used, for example, in situations such as:

- **Second authentication factor** in order to add extra security in log-in process.
- **Access to mobile applications** without a password.
- **Access to buildings** (offices, events, facilities of any kind ...).

- **Payment method**, both in physical and online stores.
- **Access to a locked device.**
- **Check-in in tourist services** (airports, hotels...).

6. Conclusions

Currently Face recognition systems are associated with many top technological companies as well as industries making the work of face recognition easier. The use of the python programming along with the 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 paper will be definitely helpful for many as it is user friendly and cost_ efficient system. Hence by the use of python along with the OpenCV the face recognition system can be designed for various purposes.

7. References

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