JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

THE DETECTION OF FACE AND EYES USING PYTHON

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ABSTRACT

This paper is mainly focused in To detect the face, eyes and smile using python opencv. OpenCV is a free and open-access image and video processing library. It is linked to computer vision, like feature and object recognition and machine learning. This paper presents the main OpenCV modules, features, and OpenCV based on Python. The paper also presents common OpenCV applications and classifiers used in these applications like image processing, face detection, face recognition, and object detection.

Keywords: Image Processing, Face Detection, Eye Detection, smile detection.

I. INTRODUCTION

Many Human-Machine Interface (HMI) tasks, such as face tracking, expression recognition and human person recognition to be efficient require the proper initialization. For example, face recognition (FR) techniques are sensitive to the accurate face alignment. Detecting only a face is often insufficient to achieve the desired final classification results. Information such as face in-plane rotation, scale and precise location can be obtained by localizing eyes on previously extracted faces. As precise eyes location enables accurate alignment, one has to first design an efficient face and eye localization method in order to develop an automatic face recognition system. Currently, the Haar Cascade Classifiers (HCC) are getting increasing attention. High detection ratio obtained with those computationally-efficient detectors suggests the possibility of using them in a reliable real-time HMI system. Therefore, our goal was first to train the efficient face and eyes HCC detectors and then to combine them into a hierarchical system. Moreover, we wanted to improve the detection rates of the HCC by introducing the additional knowledge-based criteria. In this paper we present a 3-stage hierarchical face and eye detection system based on the HCC. Firstly, we present the state of art in both face and eyes detection. Secondly, we present the idea of the HCC.

II. LITERATURE SURVEY

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. It can be regarded as a specific case of object-class detection, where the task is finding the location and sizes of all objects in an image that belong to a given class. Face detection, can be regarded as a more general case of face localization. In face localization, the task is to find the locations and sizes of a known number of faces (usually one). Basically there are two types of approaches to detect facial part in the given image i.e. feature base and image base approach. Feature base approach tries to extract features of the image and match it against the knowledge of the face features.

- A facial recognition system uses biometrics to map facial features from a photograph or video. It compares the information with a database of known faces to find a match.
- Face detection is one of the most challenging problems in disciplines such as image processing, pattern recognition and computer vision .
- Face recognition is a very challenging task because of variability of features in the photo taken.
- Different variations of scaling the faces in image, location, orientation of images (like rotated or not), pose of faces (like frontal, by side or profile) make face recognition difficult to achieve to build a performance system with practical usage.

Drawbacks of Existing System:

- Detection can be vulnerable. We've outlined the way in which facial detection can be thrown off.
- Huge storage requirements.
- Potential privacy issues.
- There is disagreement on whether face detection is compatible with human privacy rights.

III. PROPOSED WORK

For doing this project we need to import some python files which we have installed in our computer. Then we need to include some xml files in to our program Then we need to give the shape and color to display in our output. Then we need to give the waitkey to stay the gui screen in our laptop or else the screen will go immediately. After that we need to give the padding as much as we can to highlight the detecting face in the output screen. In the output screen it can detect two faces. And the detected face will be in the rectangle shape. After completing the code we need to give the name of our gui application which will show in the screen after running the code by using imshow. After running the code the gui application will display the required output.

Advantages Of Proposed System:

- Easy to integrate. Most face detection solutions are compatible with security software.
- Better security.
- Automated identification. Face detection lets facial identification be automated.
- so increasing efficiency alongside a heightened rate of accuracy.

IV. SYSTEM ARCHITECTURE

The Architecture of the Face and Eyes Detection System. Images in order to extract potential eyes. Candidate regions were verified with the SVM and the precise eyes' location was acquired with variance filters . Many people to use the HCC in the task of eyes detection. As the processing of a whole face led to many false positives (FP) they proposed the regionalized search approach. This explicitly means the use of the knowledge about a face structure i.e. looking for a left eye in an upper-left, for a right eye in an upper-right, a nose in a central and a mouth in a lower part of the face. This simple solution significantly reduced the FP ratio . used the HCC at the first stage of their detection system . In order to reduce the FP ratio the results have been verified with another boosted classifier , the one based on ordinal features rather than on Haar-like and trained with the algorithm.

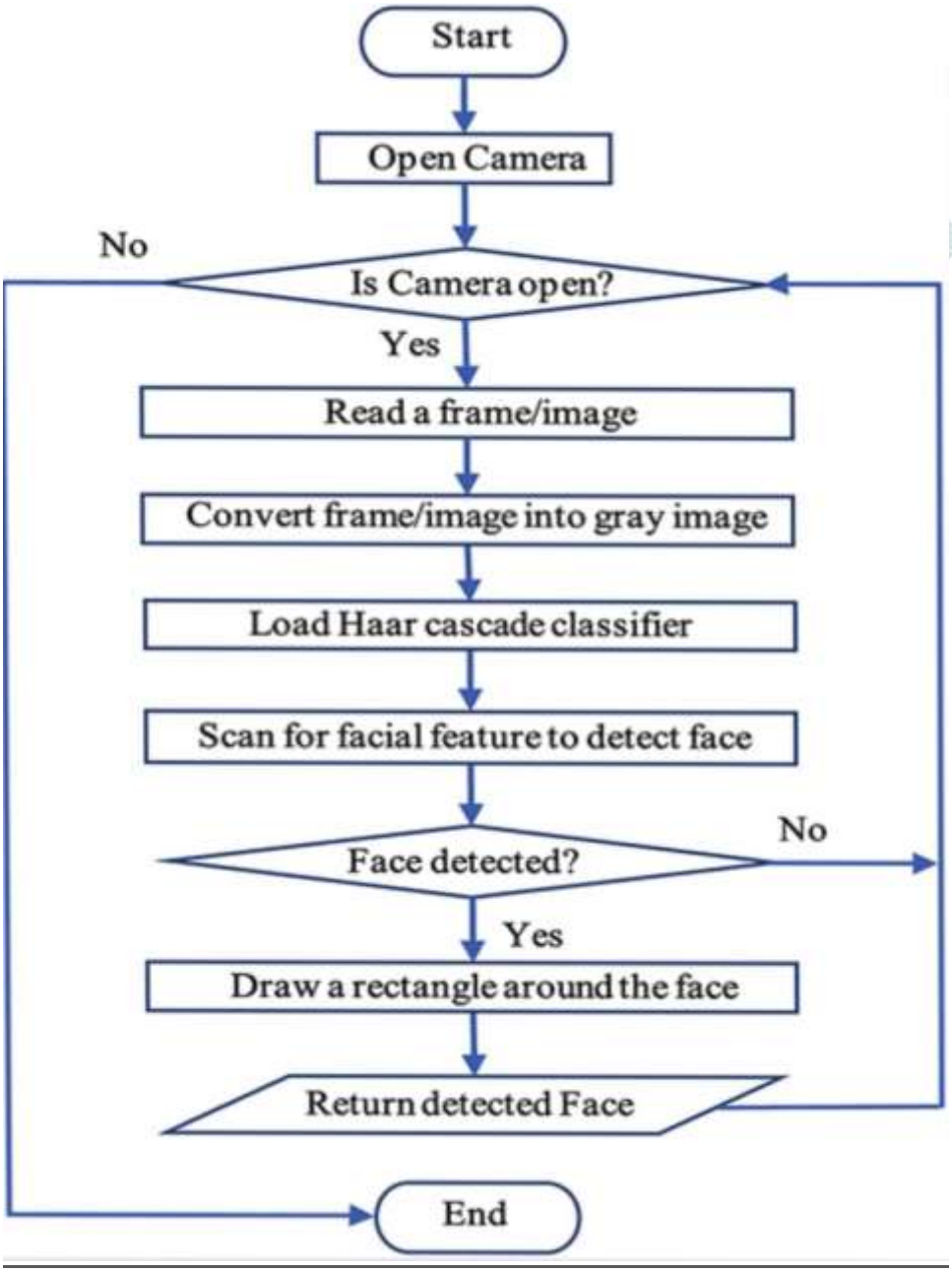

Fig 1: System Architecture

Modules:

- Get the contours of facial features: Get the contours of detected faces and their eyes.
- Recognize facial expressions: Determine whether a person is smiling or not.
- faces across video frames: Get an identifier for each individual person's face that is detected. This identifier is consistent across invocations, so you can, for example, perform image manipulation on a particular person in a video stream.
- Process video frames in real-time: Face detection is performed on the device, and is fast enough to be used in real-time applications, such as video manipulation.

Algorithm:

The haar-like algorithm is also used for feature selection or feature extraction for an object in an image, with the help of edge detection, line detection, centre detection for detecting eyes and face in the picture. It is used to select the essential features in an image and extract these features for face detection.

V. IMPLEMENTATION

OpenCV uses machine learning algorithms to search for faces within a picture. Because faces are so complicated, there isn't one simple test that will tell you if it found a face or not . We are going to use Haar Cascade. A Haar Cascade is basically a classifier which is used to detect the object for which it has been trained for, from the source. The methodology of face detection can be applied to landmark localization, which can then be utilized to face geometrical normalization . So that it can detect the face , eyes and smile at the output screen.

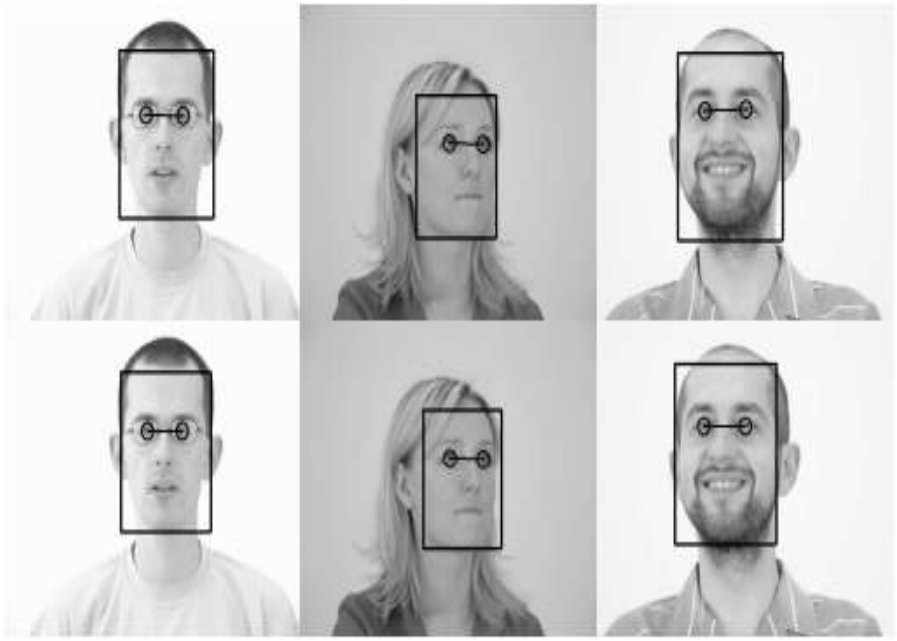

Fig 2: Detection of faces and eyes

Face and eye detection is one of the most challenging problems in computer vision area. The goal of this paper is to present a study over the existing literature on face and eye detection and gaze estimation. With the uptrend of systems based on face and eye detection in many different areas of life in recent years, this subject has gained much more attention by academic and industrial area. we recognise that haar-like feature approach is the most used method for face recognition projects (especially for video detection of faces and eyes) in recent years, due to be able to work in real time systems with great performance. With the help of

algorithms finding location of faces in images, eye detection methods show better performance. By using face recognition models in many areas, new intelligent systems, which will bring great comfort and ease to our life.

VI. CONCLUSION

Eye detection is generally dependent on face recognition. With the help of algorithms finding location of faces in images, eye detection methods show better performance. There are new approaches that try to find eyes, without detection of faces in images which also shows great performance. Methods are generally similar for face and eye detection systems. The same algorithms can be applied to detect both faces and eyes (And even these can be applicable to other objects like cars etc.). With progress in recent studies, by using face recognition models in many areas, new intelligent systems, which will bring great comfort and ease to our life, benefit from results of these studies.

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