FACE COUNTING USING OPEN CV & PYTHON FOR ANALYZING UNUSUAL EVENTS IN CROWDS

[1]P.Thenmozhi, [2]P.S.Prakash, [3]R.Dhamodharan,[4]N.Manigandan

[1]PG Scholar, [2] Associate Professor,[3] AssistantProfessor,[4]Assistantprofessor
[1]Computer Science Engineering, [2] Computer Science Engineering, [3] Computer Science Engineering,
[4]Mechanical Engineering
[1]Vivekanandha college of Engineering for women, [2]Vivekanandha college of Engineering for women,
[3]Vivekanandha college of Engineering for women,[4]Paavai Engineering College, Namakkal, Tamilnadu, India

---***---

Abstract: *The project based on face counting using Haar cascade algorithm. The proposed system involves face detection and counting, Features extraction. The face detection is to detect faces based on haar cascade algorithm using python toolbox. In feature extraction stage, the GLCM is used for different object texture and edge contour feature extraction process. A DWT organize the edge response marks in all eight routes at every pixel position and creates a code from the magnitude strength. The presumed features retain the different information of image patterns. These features are useful to differentiate the more number of tests accurately and it is matched with already stored image samples for person identification. The fake results will be shown that used policies have good discriminatory power and recognition accuracy compared with prior avenues. Face counting is a type of bio metric software application that can identify a specific individual in a digital image by analyzing and comparing patterns. Facial counting systems are commonly used for security purposes but are increasingly being used in a variety of other applications.*

Key Word–Haar cascade, Edge contour feature extraction, Discriminatory Power, Biometric Software.

1. INTRODUCTION

Overview

The main objective of this paper is to detect the person face counting correctly by using haar cascade algorithm.

Scope of the Project

The main contributions of this project therefore are

- Data Analysis
- Data processing
- Apply algorithm

DIGITALIMAGEPROCESSING

The main objective of this paper is to detect the person face counting correctly by using haar cascade algorithm. The identification of objects in an image probably start with image processing techniques such as noise removal, followed by (low-level) fee extraction to locate lines, regions and possibly areas with certain textures. The fresh bit is to interpret assortments of these shapes as one object, e.g. vans on a road, bins on a conveyor belt or tumors cells on a microscope slide. A major defect in AI problem is that an object can show very different when viewed from varied angles or under varied lighting. Another defect is deciding what feature suitable to what object and which are back or shadows etc. The human visual system accomplish these tasks most unconsciously but a computer needs skilful programming and lots of processing power to approach human act. An image is normally interpreted as a two-dimensional array of bright values, and is more familiarly reported by such patterns as those of a photographic print, slide, television or movie screen. An image can be done optically or digitally with a computer.

SYSTEM ANALYSIS

Discriminative strong native binary pattern:

Local Binary Patterns (LBP) is one altogether the fore most used ways that in face recognition. to reinforce the recognition rate and strength, some ways victimization LBP, area unit planned. Improved native Binary Pattern (ILBP) is associate improvement of LBP that compare all the pixels (including the center pixel) with the mean of all the pixels inside the kernel to reinforce the strength against the illumination variation. For the aim of holding the abstraction and gradient information, associate extended version of native Binary Patterns (ELBP) that

encodes the gradient magnitude image to boot to the initial image was propose to represent the speed of native variation. The LBP operator was first introduced as a complementary live for native image distinction by Ojala etal (1996). the first incarnation of the operator worked with the eight-neighbors of a part, victimization the value of the center component as a threshold. Associate LBP code for a neighborhood was created by multiplying the brink values with weights given to the corresponding pixels, and summation the result.

Drawbacks:

• In semblance based methods, minimal accurate of features discourse on because of entire image consideration

• In geometric based models, the geometric features like far between eyes, face length and width, etc., are viewed which not provides optimal results

Planned system:

• Feature extraction

• HAAR cascade algorithm

Benefits

• Counting is attained correctly

• Less time span

Requirement Specifications

Hardware Requirements

• System

• 4 GB of RAM

• 500 GB of Hard disk

Software requirements:

• Python all version

I.　Python

Python is an inferred prominent-level programming language for programming Python extends many options for generating GUI (Graphical User Interface). In all the GUI methods ,tk inter is most commonly used technique. It is a pendent Python interface to the Tk GUI tool kit equipped with Python. Python with tk inter outputs the quickest and easiest way to generate the GUI applications. Generating a GUI using tk inter is an simple task.

Open cv-Python

Python is a common purpose programming language initiated by Guidovan Rossum, which became most popular in minimum time mainly because of its homogeneity and code readability. It accesses the programmer to deliver his ideas in simpler lines of code without minimizing any readability. Analogized to other languages like C/C++, Python is less. But other important feature of Python is that it can be simply extended with C/C++. This feature support us to write computationally explosive codes in C/C++ and generate a Python wrapper for it so that we can utilize these wrappers as Python modules. This provide us two advantages: first, our code is as quick as original C/C++ code (since it is the real C++ code played in background) and second, it is very easy to code in Python. This is how Open CV-Python works, it is a Python wrapper along original C++ expedition and the help of Numpy makes the task more simpler. Numpy is a more optimized library for numerical methods.

Methods

Array scalars have accurately the same models as arrays. The base behavior of these models is to internally changed the scalar to an associate 0-dimensional array and to call the responding array models. In increasing, math operations on array scalars are explained so that the same hardware flags are set and used to interpret the output as for ufunc, so that the mistake state used for ufuncs also goes over to the math on array scalars.

Anaconda Navigator

Anaconda Navigator is a base graphical user interface (GUI) attached in Anaconda distribution that allows you to operate applications and simply manage conda packages, environments and channels without using command-line commands. Navigator can quest for packages on Anaconda Cloud or in a local Anaconda Repository. It is avail for Windows, macOSand Linux.

System Design

Block Diagram
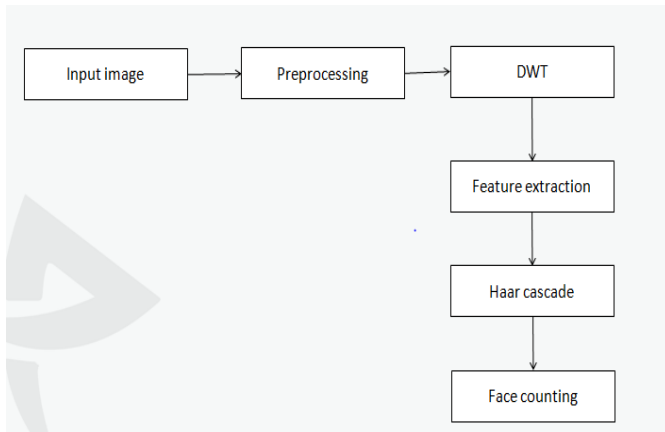
2. FACE DETECTION

Face detection is a process to get face regions from base image which has familiarized intensity and standard in size. The appearance features are get detected face part which adaptable changes of face such as furrows and shrinks (skin texture).In this system method, the face detection procedures is based on haar like modules along with required boosting method.
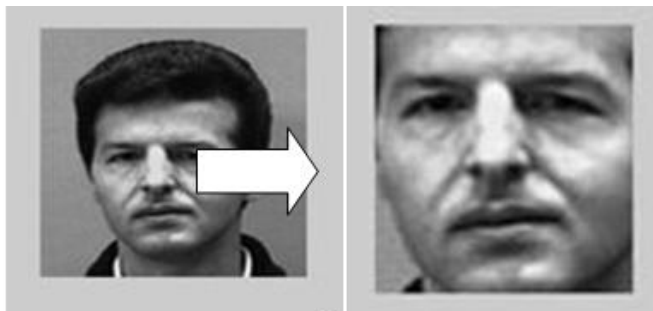
Facedetectionmodel

IMAGE ACQUISATION

Image Acquisition is to gather a digital photograph. To gather this requires a picture sensor and the working function to digitize the sign created through the sensor. The sensor may be monochrome or coloration TV camera that creates an entire photo of the fault area each 1/30 sec. The photograph sensor might also be line test virtual digital cam that creates a only one photo line at a time. In this place, the gadgets movement besides the road.

IMAGE ENHANCEMENT

Image enhancement is one of the best and greatest appealing regions of digital image organizing. Generally, the concept in the besides the enhancement strategies is to perform brief that is obscured, or clearly to spotlight certain features of real picture. A general instance of enhancement is at the obtained time as we growth the period of a photograph due to the fact "it appears greater." It is required to remember the fact that enhancement is a entirely subjective region of photo processing.

IMAGE RESTORATION

Image recuperation is a region that also deals with enhancing the presence of an image. However, not like enhancement, that is primary, photograph recuperation is aim, in the experience that restoration methods will be predisposed to be based on mathematical or probabilistic merge of picture degradation.

Module1:

Pre-processing

Image restoration is the mission of taking a corrupted/sound image and calculating the clean original image. Corruption might come in most of the forms such as motion blur, sound, and camera mis focus. Image restoration is another form of image enhancement in that the latter is created to emphasize features of the image that make the image more gratifying to the listener, but not necessarily to create realistic data from a scientific point of view. Image enhancement methods (like different stretching or de-blurring by a nearest neighbor procedure) given by" Imaging packages" use no a before model of the process that produced the image. With image enhancement sound can be effectively be erased by sacrificing some resolution, but this is not acceptable in most applications. In a Fluorescence Microscope resolution in the z-direction is not good as it is.
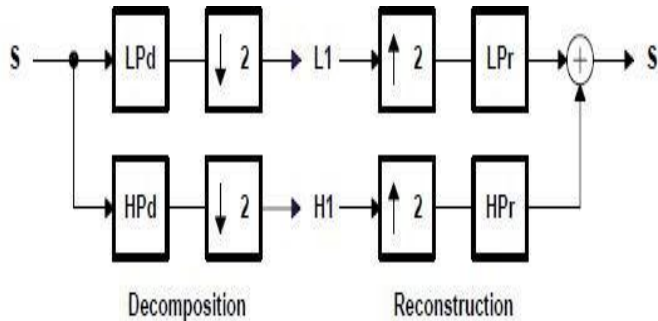
Module2:

DWT

Discrete Wavelet Transform(DWT)

The discrete wavelet remodel (DWT) became leader to use the wavelet redo to the digital international. Filter banks are used to temporary behavior of the non-prevent wavelet remethod. The sign is decayed with a immoderate-skip simple out and a low-by pass clear out.

The coefficients of these filters are executed using mathematical evaluation and done to be had to you. See Appendix B for many results about those computations.

Where,

LP d: Low Pass Decomposition Filter

HP d: High Pass Decomposition Filter

LP r: Low Pass Reconstruction Filter

HP r: High Pass Reconstruction Filter

Module3:

GLCM

Gray-LevelCo-OccurrenceMatrix:

To produce a GLCM, use the gray co matrix benefits. The gray co matrix benefits produces a gray-level co-occurrence matrix (GLCM)by estimatinng how often a pixel with the intensity (gray-level) value I reached in a required spatial relationship to a pixel with the value j. By standard, the spatial relationship is explained as the pixel of interest and the pixel to its sudden right (horizontally adjacent),but you can identify others partial relationships between the two pixels. Each element (i,j) in the output GLCM is easily the addition of the number of times that the pixel with value I appeared in the required spatial relationship to a pixel with letter j in the input value. Because the arranging required to estimate a GLCM for the all dynamic range of an image is prohibitive, gray co matrix scales the input image. By standard, gray co matrix uses scaling to down the number of intensity values in gray scale image from 256 to eight. The number of gray levels specific the size of the GLCM. To organize the number of gray levels in the GLCM and the scaling of intensity grades, using the Number Levels and the Gray Limits requirements of the gray co matrix function. See the gray co matrix base page for more ideas.

The gray-level co-appearance matrix can reveal certain things about the spatial distribution of the gray levels in the texture image. For example, if many of the entries in the GLCM are focused along the diagonal, the texture is coarse with respect to the required offset. To explain, the following diagram shows how gray co matrix estimates the first 3 values in a GLCM. In the output of GLCM, element (1,1) has the value 1 because there is one instance in the input image where 2 horizontally adjacent pixel shave the values1 and1, accordingly.

GLCM(1,2) have the value 2 because there are two instances where two horizontally adjacent pixels have the values 1 and 2.Element (1,3) in the GLCM has the value 0 because there are no required instances of two horizontally adjacent pixels with the values1and 3. Gray co matrix continues its processing the input value, printing the image for other pixel pairs (i,j) and recording the sums in the required elements of the GLCM.
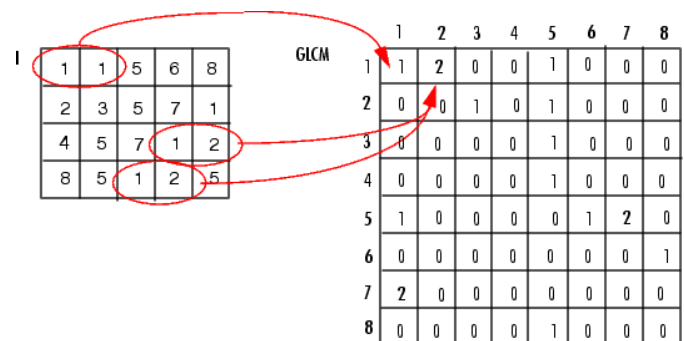
To Produce many GLCMs, required an array of offsets to the gray co matrix function. These offsets define pixel relationships of different direction and distance. For example, you can explain an array of offsets that four directions(horizontal, vertical, and two diagonals) and four distances. In this case, the input values is represented by 16 GLCMs. When you estimate statistics from these GLCMs, you can take the mean.

You identify these offsets as ap-by-2 array of integers. Every row in the array is a two-element vector, [row offset, col offset], that requires one offset. Row offset is the number of rows between the pixel of interest and its neighbor. Col offset is the different number of columns among the pixel of possession and its neighbor. This example generates an offset that requires our directions and 4 distances for each direction. After you produce the GLCMs, you can solve several statistics from them using the gray co props mission. These statistics provide ideas about the texture of an image value. Statistic such a as

Contras, Correlation, power, Homogeneity gives idea about image.

Module4:

Haar cascade

Haar Cascade algorithm is one of the more powerful algorithms for the detection of objects particularly face detection in Open CV planned by Michael Jones and Paul Viola in their research ideas called "Rapid Object Detection using a Boosted Cascade of Easy Features" and this algorithm was planned in the year 2001which uses a mission called cascade works for the detection of objects in the image values and a many of negative images and positive images are used to rail this cascade function and this cascade function return back the image with rectangles drawn near the faces in the image as the result.

Conclusion

To this objective count the face of the human by using haar cascade algorithm solution here we get input images, finding and classifying the result. we comprehensively examine the wavelet transform and GLCM feature extraction methods to types the output. By using these models we got a high accuracy, specificity, and the performance also be gained.

Future Enhancement

In future we gained the performance of this process and able to get high accuracy.

REFERENCES

[1] Ahonen.T,Hadid.AandPietikäinen.M,(2004)'Facedescriptionwithlocalbinarypatterns',inProc.Eur.Conf.Comput.Vis.

[2] AnbangYaoandShanYu,(2013)'RobustFaceRepresentationUsingHybridSpatialFeatureInterdependenceMatrix'.

[3] Daubechies.I,(1990)'Thewavelettransformtime-frequencylocalizationandsignalanalysis',IEEETrans.InformationTheory.

[4] Jain.A.K,(1989)'Fundamentalsofdigitalimageprocessing',PrenticeHall.

[5] JulienMeynet,(16thJuly2003)'FastFaceDetectionUsingAdaBoost'