Review Paper on Real Time Age Rank Approximation with Gender Recognition with Image Processing

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ABSTRACT

Face recognition plays vital role in our day today life. And from some years it's been studying by several investigators which have focused on the pose illumination, expression plastic surgery is very important due to the safety purpose. Everyone wants their property to be secure so face recognition is that the one which is employed for security purpose. As it is very relaxed to recognize the face images of the well-known personalities such as stars in various fields like films, sports, politics, social workers etc. because the label suggest recognizing face images with age and weight factor. The comparison between existing and future algorithm on database shows that proposed algorithm completes significantly.

Keywords: Face Recognition, Security, Algorithms

I. INTRODUCTION

With growing numbers of face recognition applications in a day to day life has made face recognition important research topic now daily in recent years face recognition has received significant consideration from both research groups and the market, but still continued very interesting in real applications. Variety of distinctive algorithms is presented, being characterized into appearance based and model-based schemes. As we are kith and kin there are plenty of aspects which bring lots of variations on us. In our facial expressions our structure etc. this can be the action and is suffering from variety of factors in our day to day life or we will say in our surroundings or our life style. So improving presentation of face recognition with age being combined.

Gender recognition is that the very graceful thought among people but it's very complex process for the computer. For social life, gender factor undertakes effective role within the communication. Computer based system during which spontaneous gender recognition method may be a field of the pc vision. This process is implemented with the facial notifies or any parts of body which ignore such informs. At the method of facial informs, thanks to the very fact that irregular feature of gender like make-up or beard decrease to comparison ratio, simplify to acknowledge and increase consistency and robust of system classify.

II. LITERATURE REIVEW

Face detection is used in biometrics, frequently as a part of (or together with) a facial recognition structure. Some current digital cameras use face detection for autofocus. Face detection is also beneficial for choosing areas of interest in photo. Face detection is in advance the interest of marketers. A webcam can be integrated into a television and detect any face that walks by. The system then computes the race, gender, and age range of the face. Once the data is composed, a series of announcements can be played that is specific toward the detected race/gender/age. This paper shows prototype or partial application of this type of work. Face detection is also being studied in the area of energy conservation. Procedure for face recognition based on information theory method of coding and decoding the face image is discussed in [Sarala A. Dabhade & Mrunal S. Bewoor, 2012].

Proposed methodology is connection of two stages – Face detection using Haar Based Cascade classifier and recognition using Principle Component analysis. Various face detection and recognition methods have been evaluated [Faizan Ahmad et al., 2013] and also solution for image detection and recognition is proposed as an initial step for video surveillance. Implementation of face recognition using principal component analysis using 4 distance classifiers is proposed in [Hussein Rady, 2011].

Lanitis et al. proposed the first approach applying AAM to age estimation, which extracts craniofacial growth and skin aging during childhood and adulthood. Age-specific estimation, which is based on the assumption that the aging process is identical for everyone and appearance-specific estimation, which follows the assumption that people who look similar tend to have similar aging processes. Zhang et al. formulated the inference of each person's age as a warped Gaussian process (WGP) estimation problem, and developed a multi-task extension of WGP to solve the problem. Since different individuals have different aging processes, personalization is beneficial for age approximation. Previous researches also show that personalization can improve the performance of age approximation.

III. PROPOSED WORK

Problem definition: Proposed scheme uses age and gender differences and FERET database for face recognition using 4 main techniques, namely

Techniques	Description
1. Viola Jones	This algorithms basic principal is to identify the faces from the specific input image. Viola Jones algorithm were the detector's rescale and of several kind the size of image.
2. CNN classifier	A convolutional neural network is a gathering of deep, feed-forward artificial neural networks, most commonly applied to investigating visual imagery. Convolutional networks were inspired by biological methods. Description of the process as a convolution in neural networks is by convention.
3. Local Binary Patterns (LBP)	LBP is one of the binary patterns which are used for the feature extraction. LBP is used since there are micro patterns which are invariant of monotonic grey scale renovation. Conjoining all this gives the face image.
4. Support Vector Machines (SVM)	In support vector machine is used to analyse the complex data and gives the result. SVM is actual useful in finding patterns which are exact useful and not complex.

Architecture:
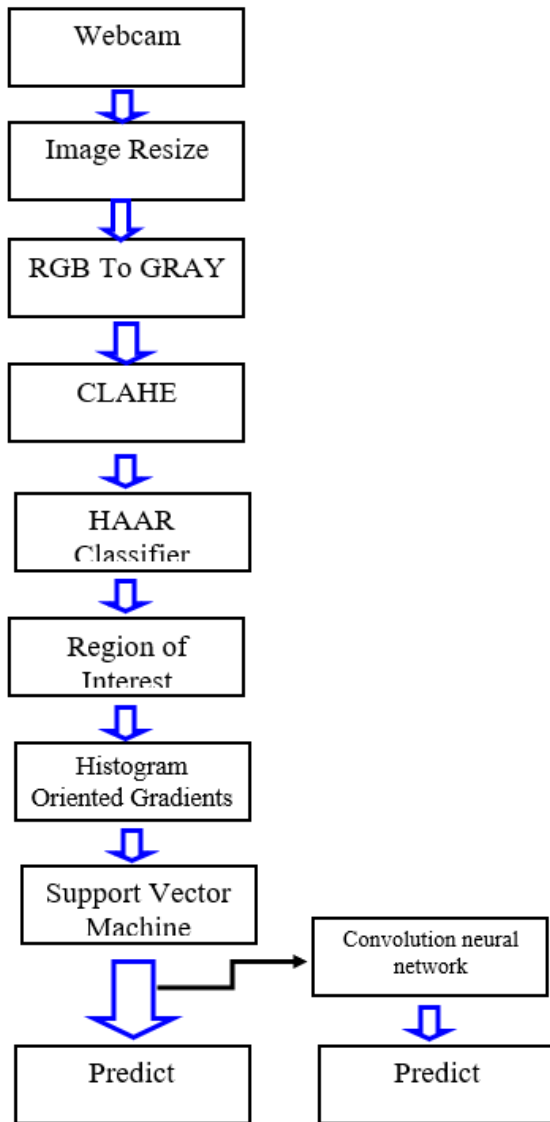
Figure1. Flow Graph of Architecture

Following are the steps involved in architecture:

1. Webcam and Image Acquisition: Here, read the image from input camera at any given frame rate.
2. Image Resize: Resize the image input image into standard image format.
3. RGB TO GRAY: Converting RGB image to GRAY scale format for efficient image processing in next subsequent steps.
4. CLACHE: CLACHE algorithm is used for Histogram Equalization to balance the light intensity in the input image.
5. HAAR Classifier: This algorithm is use to detecting the faces from input GRAY scale image which returns face as region of interest.
6. Histogram Oriented Gradients: This algorithm is used for feature extraction purpose and this algorithm focuses on shape and texture of extraction faces. This is used for gender detection.
7. CNN AND SVM: This algorithm is decision making and makes prediction on input images base on pre-trained model.CNN predict the age according to given face image.SVM predict the gender according to shape and texture of face.

IV. LIABRARY AND LANGUAGE

- **OpenCV Library:**

OpenCV (Open Source Computer Vision) is a library of programming functions mainly designed for real-time computer vision firstly developed by Intel. OpenCV (Open Computer Vision) framework that licenses its simple usage with Python language. The library is multiplatform and can be used on the GNU/Linux, Mac OS X and Windows operating systems. The library has been planned mainly for processing images in real time.

OpenCV is written in C++ and its main interface is in C++, but it still upholds a less comprehensive though extensive older C interface. There are attachments in Python, Java and MATLAB/OCTAVE. The API for these interfaces can be originate in the online documentation. Packages in other languages such as C#, Perl, Haskell and Ruby have been developed to inspire adoption by an extensive audience. All of the new developments and algorithms in OpenCV are now technologically advanced in the C++ interface. OpenCV runs on the following desktop operating systems: Windows, Linux, macOS, FreeBSD, NetBSD, OpenBSD. OpenCV runs on the following mobile operating systems: Android, iOS, Maemo, BlackBerry 10. OpenCV-Python is a library of Python bindings designed to solve computer vision difficulties.

- **Python Language:**

Python is an object-oriented, high-level programming language with combined dynamic semantics mainly for web and app development. It is very attractive in the field of Rapid Application Development because it deals with dynamic typing and dynamic binding options. Python is comparatively simple, so it's easy to learn since it needs a distinctive syntax that focuses on readability.

Developers can read and interpret Python code much stress-free than other languages. In turn, this decreases the cost of program maintenance and development because it allows teams to work collaboratively without substantial language and experience obstacles. Python supports the use of modules and packages, which mean that programs can be intended in a modular style and code, can be reused across a variety of projects Python available to almost any person. Python can also be used to process text, display numbers or images, solve scientific equations, and save data.

V. TECHNOLOGIES

- **Image Processing:**

 Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image. Image processing basically includes the following three steps: Importing the image via image acquisition tools; Analysing and manipulating the image; Output in which result can be altered image or report that is based on image analysis.

- **Computer Vision:**

Computer vision is a field of artificial intelligence that trains computers to interpret and understand the visual world. Using digital images from cameras and videos and deep learning models, machines can accurately identify and classify objects and then react to what they "see."

VI. RESULTS

A combination of global and grid features are extracted from face images. The global features such as distance between two eye balls, eye to nose tip, eye to chin, and eye to lip is calculated in figure using four distance values, four features are calculated.

Four features F1, F2, F3, and F4 denotes the global features and the feature F5 is calculated for grid features.

The CLAHE algorithm edge detection technique is used for finding the grid features.

The four features F1, F2, F3, and F4 are calculated as follows:

F1 = (distance from left to right eye ball) / (distance from eye to nose)

F2 = (distance from left to right eye ball) / (distance from eye to lip)

 F3 = (distance from eye to nose) / (distance from eye to chin)

F4 = (distance from eye to nose) / (distance from eye to lip)

F5 = the angle between right eyeball, mouth point, and left eye ball in face image.

Using the Grid features of face image, feature F5 is calculated. It is entirely based on wrinkle geography in face image. The grid feature includes forehead portion,

eyelid regions, upper portion of cheeks and eye corner regions as shown in Fig.

To calculate feature F5, the following steps have to be followed: The color face image is converted into gray scale image. CLACHE algorithm is used for Histogram Equalization to balance the light intensity in the input image.HAAR Classifier algorithm is use to detecting the faces from input GRAY scale image which returns face as region of interest and Histogram Oriented Gradients algorithm is used for feature extraction purpose and this algorithm focuses on shape and texture of extraction faces. This is used for gender detection.

VII. CLASSIFICATION

Age ranges are classified dynamically depending on number of groups based on the above six features F1 to F6. Support vector machine (SVM) is used as age classifier technique. Age classification is done into 2, 3, and 4 age range groups shown in Table I. Using five features F1 to F5, age classification is done into 5 age range groups.

VIII. CONCLUSION

Age, gender and other facial traits represent information important to a wide range of tasks. Our work leads us to the conclusion that wrinkle geography analysis has been the best procedure to estimate human age range of an individual. For proper ,image should be of a straight frontal face. Image should contain single human face only. This paper works with 85% accuracy for age group clusters, and 90% accuracy for gender recognition. CNN predict the age according to given face image and SVM predict the gender according to shape and texture of face.

Here, we are primarily motivated by the observation that the amount of data available for the study of a computer vision problem, in particular the problems considered here, can have an immense impact on the machine capabilities developed to solve it. In answer to this, we provide two contributions: a new and extensive data set and for the study of age and gender estimation, and a classification pipeline designed with an emphasis on making the most of what little data is available.

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