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POSITIONAL TERNARY PATTERN FEATURES BASED HUMAN AGE CLASSIFICATION AND ESTIMATION USING ARTIFICIAL NEURAL NETWORK

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***Abstract*—In this paper, it is proposed to have a method for classification of human age using Artificial Neural Network(ANN) classifier. The classification of human age from facial pictures plays an important role in pc vision, scientific discipline and forensic Science. the various machine and mathematical models, for classifying facial age together with Principal component Analysis (PCA), positional Ternary Pattern (PTP) are planned yields higher performance. This paper proposes a completely unique technique of classifying the human age group exploitation Artificial Neural Network. This is often done by pre-processing the face image initially and so extracting the face options exploitation PCA. Then the classification of human age is finished exploitation Artificial Neural Network (ANN). The age is classed into four classes: kid, Young, Middle- aged, and Old. The method of combining PCA and ANN perform higher rather victimization separately.**

Keywords— **Facial Recognition, Positional Ternary Pattern, GLCM Feature extraction, Principal Component Analysis, Artificial Neural Network, MATLAB 2014.**

I. INTRODUCTION

Age Classification is a task which human can perform effortlessly but it is extremely difficult for machines. Over the last few decades the Age Classification technology is extremely popular area of research. Comparing with other biometrics, the most superiority of face biometric is its non-intrusive nature. One more advantage is that image can be taken from a long distance which is not possible in other bio metric approaches. Therefore Age Classification (AC) Technology is one of the fastest growing biometric fields .

In this paper we propose a PTP & PCA feature extraction to detect faces in face images. The feature extraction first detects the faces using RGB color model and divides the face region into blocks of equal size then extracting the face features using PCA. After, the Back propagation Neural Network method is used to classify the human age into four categories: Child, Young, Middle- aged, and Old.

II. REVIEW OF LITERATURE

This paper concerns the estimation of facial attributes particularly, age and gender from images of faces acquired in difficult, within the wild conditions. This downside has received way less attention than the connected downside of face recognition, and especially, has not enjoyed an equivalent dramatic improvement in capabilities demonstrated by modern face recognition systems. Here, we tend to address this downside by creating the subsequent contributions. First, in answer to at least one of the key issues of age estimation

analysis absence information we provide a singular data set of face pictures, tagged for age and gender, non-inheritable by smart-phones and alternative mobile devices, and uploaded without manual filtering to on-line image repositories. We tend to show the pictures in our assortment to be tougher than those offered by alternative face-photo benchmarks. Second, we tend to describe the dropout-support vector machine approach utilized by our system for face attribute estimation, so as to avoid over fitting. This technique, impressed by the dropout learning techniques currently popular deep belief networks, is applied here for coaching support vector machines, to the most effective of our data, for the primary time. Finally, we tend to present a robust face alignment technique that expressly considers the uncertainties of facial feature detectors. we tend to report in depth tests analyzing each the issue levels of up to date benchmarks likewise because the capabilities of our own system. These show our technique to outstrip progressive by a good margin. [1]

We think about the matter of automatic age estimation from face pictures. Age estimation is sometimes developed as a regression downside relating the facial expression and therefore the age variable, and one regression model is learnt for all ages. We have a tendency to propose a hierarchical approach, wherever we have a tendency to initial divide the face pictures into numerous age teams so learn a separate regression model for every cluster. Given a take a look at image, we have a tendency to initial classify the image into one amongst the age teams so use the regression model for that specific cluster. To enhance our classification result, we have a tendency to use many alternative classifiers and fuse them mistreatment the bulk rule. Experiments show that our approach outperforms several state of the art regression ways for age estimation. [3]

Human age will give important demographic data. During this paper, we have a tendency to tackle the estimation older in face pictures with possibilities. The look of the planned methodology is predicated on the relative order older labels within the information. The age estimation drawback is reworked into a series of binary classifications achieved by convolution neural network. Every classifier is employed to evaluate whether or not the age of input image is larger than a precise age and therefore the calculable age is obtained by adding likelihood values of those classification issues. The planned method: Deep possibilities (DP) of facial age shows enhancements over direct regression and multi-classification strategies. [5]

III. BLOCK DIAGRAM

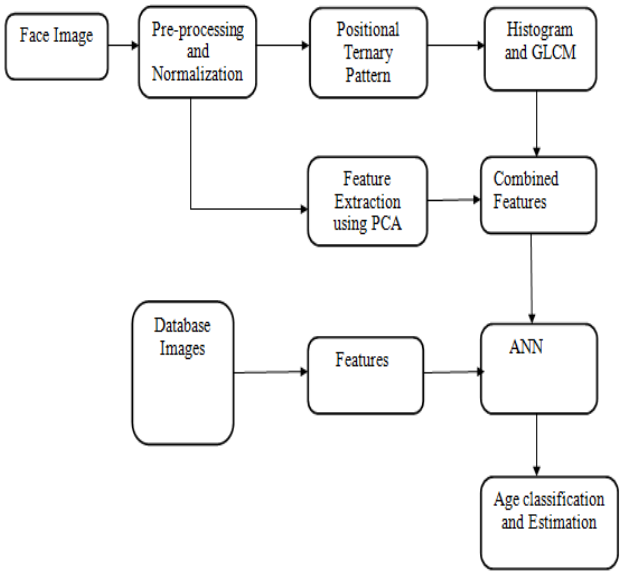


Fig1: Block diagram of Human age classification using ANN

IV.SYSTEM ANALYSIS

1. Input image

2. Database creation
3. Preprocessing
4. Positional Ternary Pattern
5. Principal Component Analysis
6. GLCM Feature Extraction
7. Artificial Neural Network
8. Result

A. PREPROCESSING

Image pre-processing is that the term for operations on images like changing the RGB image to a gray one by adjusting the resolution of the image as needed .These operations don't increase image information content however they decrease it if entropy is associate degree metric. The aim of pre-processing is associate degree improvement of the image information that suppresses unwanted distortions or enhances some image options relevant for more process and analysis task. Plane Separation on Red / Green / Blue happens.

B. POSITIONAL TERNARY PATTERN

Positional Ternary Pattern (PTP) assigns eight bit computer code to every element of a picture. Initially, Kirsch compass masks computes the sting response of eight neighborhood pixels. Then, we tend to choose the first and secondary direction from those edge responses. Here, we tend to take an extra step to pick out the secondary direction in such some way that, it will represent higher corner structure of that element. At last, we tend to introduce a ternary pattern of the first direction that distinguishes the flat and edge-based region.

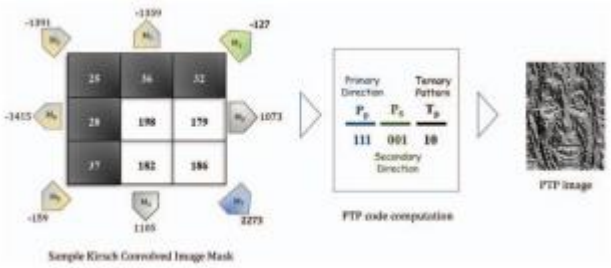


Fig2: PTP code computation steps

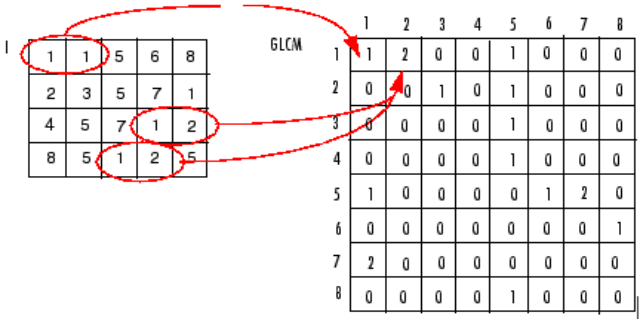
C. PRINCIPAL COMPONENT ANALYSIS

Principal components analysis (PCA): PCA seeks a linear combination of variables such the most variance is extracted from the variables. It then removes this variance and seeks a second linear combination that explains the most proportion of the remaining variance, and so on. This can be referred to as the principal axis methodology and leads to orthogonal (uncorrelated) factors. PCA analyzes total (common and unique) variance.

Eigenvectors: Principal elements (from PCA - principal elements analysis) replicate each common and distinctive variance of the variables and will be seen as a variance-focused approach seeking to breed each the overall variable variance with all elements and to breed the correlations. PCA is much a lot of common than PFA, however, and it's common to use "factors" interchangeably with "components."
The principal elements square measure linear combos of the first variables weighted by their contribution to explaining the variance in a explicit orthogonal dimension.

Eigenvalues: Additionally referred to as characteristic roots. The eigenvalue for a given issue measures the variance all told the variables that is accounted for by that issue. The magnitude relation of eigenvalues is that the magnitude relation of instructive importance of the factors with relation to the variables. If an element contains a

low eigenvalue, then it's contributive very little to the reason of variances within the variables and will be unnoticed as redundant with more necessary factors. Eigenvalues live the quantity of variation within the total sample accounted for by every issue. A factor's eigenvalue is also computed because the ad of its square factor loadings for all the variables.



D. GLCM FEATURES EXTRACTION

This process using creates a GLCM, use the gray co-matrix function. Particular function create has gray level Co-occurrence matrix GLCM by calculation how often a particular pixel with the intensity value i occurs in a specific spatial relationship to a pixel with the value j. This process number of gray levels in the image determines the size of the GLCM. By default, gray co-matrix uses scaling to reduce the number of intensity values in an image to eight and you can use the Num Levels and the Gray Limits parameters to control this scaling of gray levels. In GLCM has reveal certain properties about the spatial distribution of the gray levels in the texture SIGNALS.

For example, the GLCM is concentrated along the diagonal and texture is coarse with respected to the specified offset .in GLCM can also derive stoical measures and the derive statistics from GLCM and more information from plot correlation .show in following fig. how to gray co-matrix calculate the 1st three value in given GLCM.

E. ARTIFICIAL NEURAL NETWORK

The performance of the Artificial Neural Network was evaluated in terms of coaching performance and classification accuracies. Artificial Neural Network offers quick and correct classification and could be a promising tool for classification of the result. The ANN with FF is trained with reference options set and desired output exploitation 'newff' and 'train' command. Here, target one for dataset1, two for dataset2 and dataset3 area unit taken as desired output. Once the coaching, updated weight issue and biases with alternative network parameters area unit hold on to simulate with input options .At the classification stage, take a look at image options area unit utilized to simulate with trained network model exploitation 'sim' command. Finally it returns the classified price as one ,2 or three supported that the choice are going to be taken as our age classification.

V. RESULT AND DISCUSSION

In existing system we are using databases one for input database and another one is storage database. In this technique we are using Gabor filter we can

calculate the individual face and mark the key points after that we are applying LDA feature extraction we can get the output. The output result should be come 75% of accuracy only. But in our proposed system we are introduce the detecting human face then classifying age using PTP, PCA and Artificial Neural Network classification we can get the output. The output result should be come 92% of accuracy.

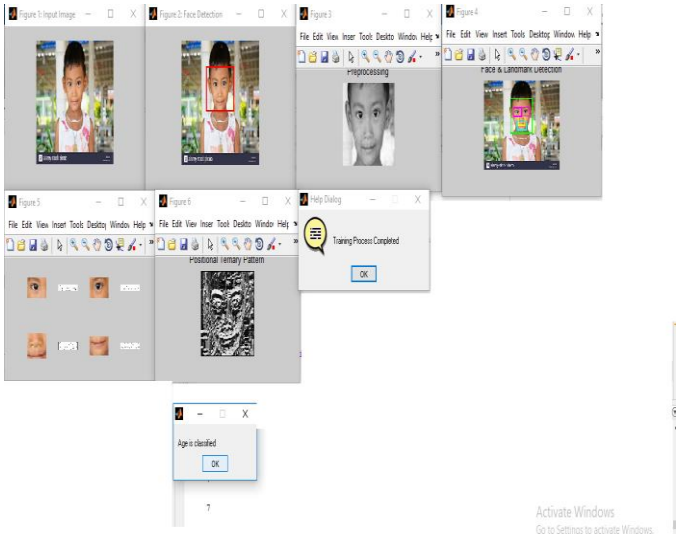


Fig 3: Result of Child Age

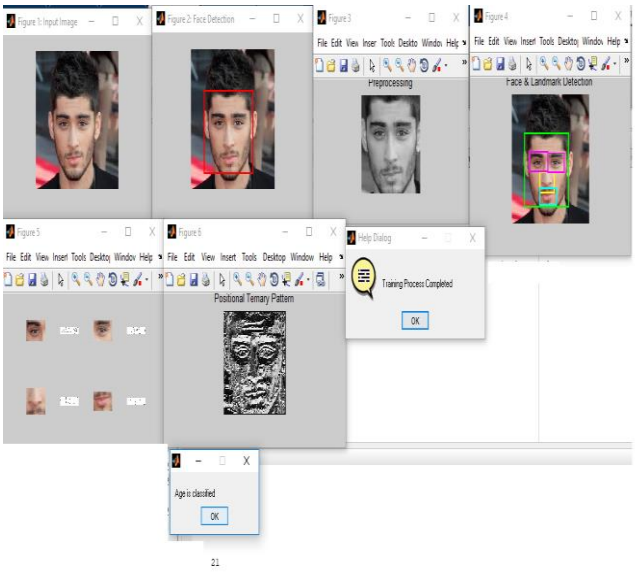


Fig 4: Result of Young Age

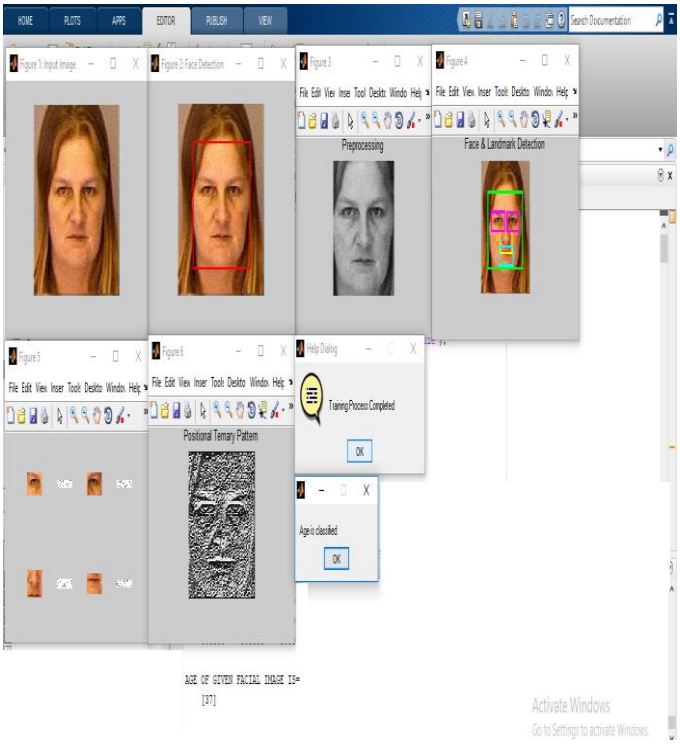


Fig 5: Result of Middle Age

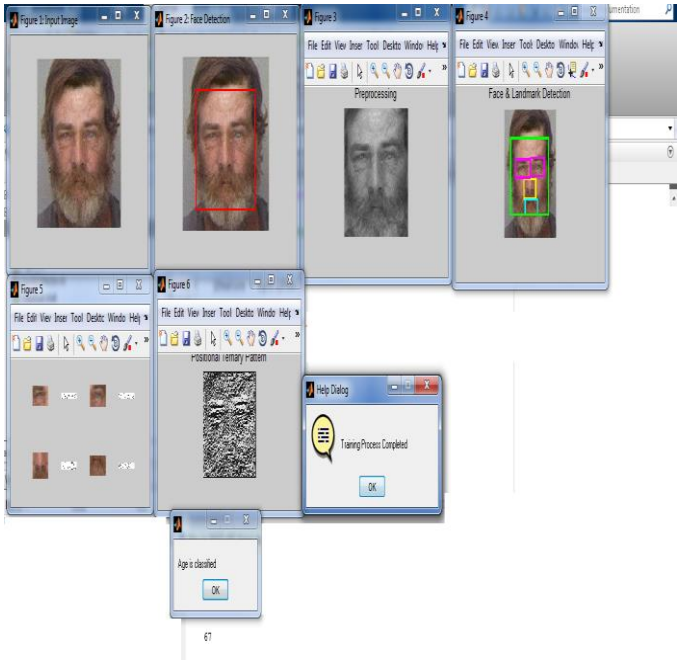


Fig 6: Result of Old Age

V. CONCLUSION

In this paper, we have a tendency to propose a way for human age classification using a positional ternary pattern, PCA and ANN classification and used this prediction in our automatic system for detecting human behavior. This work could be a continuous study from previous analysis on the employment of heterogeneous knowledge for autonomous detection of human behavior. Face pictures are a sort of knowledge which might improve the proof in work a suspect or an occurrence. This technique can cut back the scope in distinctive suspicious persons within the forensic investigation space. The primary step within the methodology involves extracting the options from face pictures employing a positional ternary pattern and PCA. Then, we have a tendency to applied ANN to classify the ages. The transfer learning was then accustomed with success utilize the already learn data for a replacement task with restricted dataset. Despite the fact that, once the dataset is little, the results area unit far better than mistreatment traditional handcrafted options like Haar. The planned technique was tested on the Face datasets, and therefore the results are unit terribly encouraging the odds of accuracy for age classifications are 92.33% and 80.17% respectively, that demonstrates that the answer is possible. Within the future work, the results are going to be combined with another datasets. Knowledge fusion techniques are going to be applied to integrate all the knowledge to provide an improved overall call which might assist investigators find suspicious persons.

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