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FACE RECOGNITION USING HAAR WAVELET TRANSFORM

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ABSTRACT: In image processing is to identify the human faces in difficult to recognizing image analysis which has each day most applications. The main idea in the building of the detector is a learning classification built on ada-boost. The family of simple classifiers contain simple rectangular wavelets which are reminiscent of the Haar basis. Their ease and a new image representation called Integral Image allow a very quick computing of these Haar-like features. A assembly in cascade is introduced in order to reject quickly the easy to classify background regions and focus on the inflexible to classify windows. The structure of the SVM classifier allows a real-time implementation of the indicator. Some results on real world examples are presented. The detector yields good detection rates with frontal faces then the process can be easily adapted to other object detection tasks by changing the contents of the training dataset.

KEYWORDS: Face recognition, Haar Wavelet Transform.

1 INTRODUCTION

Image is defined as a 2D function, f(x,y) and processing is application, pixels are small individual elements of a digital image, each and every pixel has a particular location and brightness or intensity value.

Image processing is defined as the process of estimating and manipulation images using a computer. Image processing has 2 types one is analog image processing and another one is digital image processing. The important needs for DIP are to improve the pictorial information for human interpretation and to process duplicate data for storage, transmission and representation.

Non-uniform blur-robust algorithm is used to build an energy function with direction through the texture feature on the camera motion.

Single images taken with the small variations in pose. Small changes is taken in original image. It get less accuracy for recognize human faces.

Drawbacks are using It has only feature techniques on that image.Accuracy range is low.

The proposed face detection background is based arranged the AdaBoost learning algorithm using Haar features. However, the look detection requires considerable computation control because many Haar feature classifiers check all pixels in the pictures.

Although real-time face detection is possible using in height performance computers, the resources of the classification tend to be monopolized by face detection.

Advantage: AdaBoost is an algorithm which minimize the classification error. Accuracy range is high.

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2 RELATED WORK

A.Amira, P. Farrell Face recognition is an active research area spanning such as image processing, computer vision and neural networks. An automatic system based on wavelet transform for face recognition is proposed in this paper. Segmentation algorithms has been implemented to investigate the best performances.

R.S. Smith, J. Kittler, M. Hamouz, J. Illingworth One successful approach to feature extraction in face recognition problems is that of LDA. An experimental evidence, using the XM2VTS face database, that an ensemble of SVM classifiers operating in the angular LDA space. It is capable of making more accurate face verification and identification decisions.

Irene Kotsia and Ioannis Pitas, Senior Member, Two novel methods for facial expression recognition in facial image sequences are presented in this paper. The response to a novel multiclass Support Vector Machine (SVM) system of classifiers that remain used to recognize either the six straightforward facial expressions or a set of chosen Facial Action Units (FAUs).

Matthias Rätsch, Gerd Teschke, Sami Romdhani, then Thomas Vetter, MemberA novel method for reducing the runtime complexity of a support vector machine classifier is untaken. The new training algorithm is fast and simple. This algorithm is applied to the problem of face detection**.**

Mir Hashem Mousavi, Karim Faez, Amin Asghari In this paper, we presented a original method for automated 3D face recognition by range data. An object recognition system generally consists of twofold main parts: data registration and data comparison. Classification was carried out by calculating the similarity score between thefeature vectors.

3 SYSTEM DESCRIPTION

Surface respect is a software application that can be identify a exact individual in a digital image by analyzing and comparing patterns.

1. Pre processing
2. Face detection
3. Skin detection
4. Unsupervised segmentation
5. Face extraction
6. Face recognition

Main focus of the work is for large changes in facial expressions can be handled during recognition process. The after stages must be followed 1) Contrast 2) Correlation 3) Homogeneit 4) Energy 5) Mean 6) Mean ratio 7) Standard deviation.

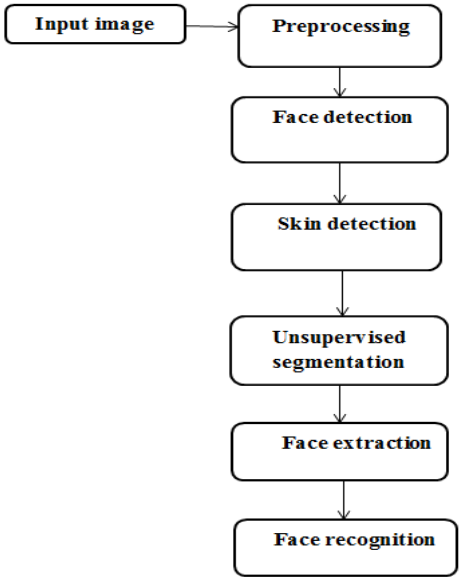

Fig1: system description

4 IMPLEMENTATION

This unit defines the implementation of the proposed work. The proposed work consists of the following methods implementation.

- Pre processing
- Face detection
- Skin detection
- Unsupervised segmentation
- Face extraction
- Face recognition

A. Preprocessing:

To collect blur, illumination, different poses in the images of the same person. Input face image is splitted into direct input and Gaussian filtered input.

Gaussian filter is used for blur images and noise is removed.Mean filter is used for illumination condition is corrected.

The two filter takes been applied, convert the input image into a gray scale image.

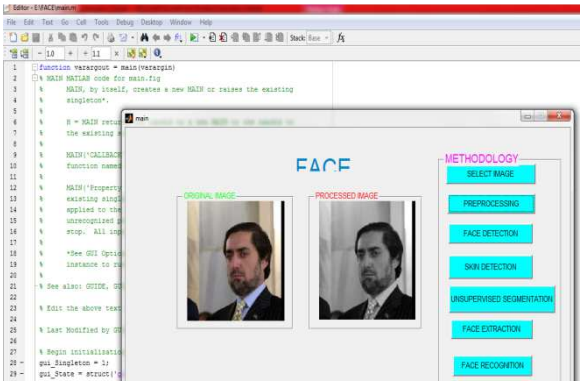

Fig2: Screen shot for preprocessing

B. Face detection:

In this module, get haar features for face detection.The Haar convert is the modest of the wavelet transforms.

This transform cross-multiplies a function beside the Haar wavelet with various shifts and stretches.

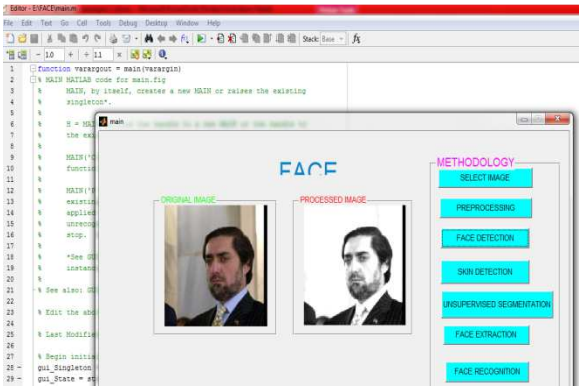

Fig3: Screen shot for face detection

C. Skin detection:

Skin detection is the method of finding skin colored pixels and regions in an image.

RGB color is converted into LAB color space for detect skin in image.

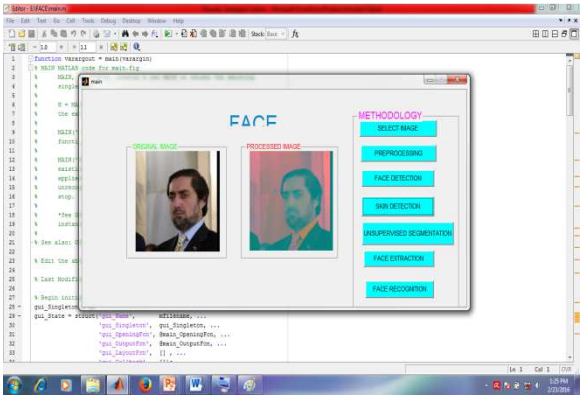

Fig4: Screen shot for skin detection.

D. Unsupervised segmentation:

Segment the casing images based on a mixture of Beta distributions.

It used an unsupervised learning technique with Beta distribution toward estimate the statistical parameters of the data in skin double then estimate the thresholds for segmentation.

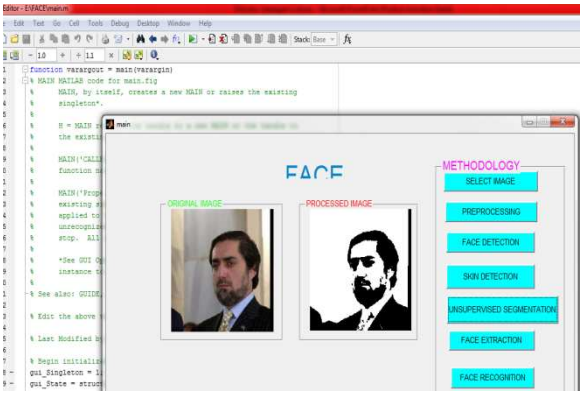

Fig5: Screen shot for unsupervised.

E. Face extraction:

A numerical method of examining texture that considers the three-dimensional relationship of pixels is the gray-level co-occurrence matrix (GLCM), likewise known as the gray-level spatial need matrix.

The GLCM functions describe the texture of an image by calculating by what method often pairs of pixel with specific values and in a specified three-dimensional relationship occur in an image, creating a GLCM, then extracting statistical measures from this matrix. The next 7 feature.

1. Contrast:

Brightness of a duplicate. Now graphical perception of the existent world contrast is determined by the difference in the color and brightness of the object then other objects with in the same field or view. The human visual system is more sensitive and contrast than absolute illuminance. Contrast is calculated as

$$\sum_{i,j=0}^{N} \boldsymbol{P}_{i,j}\,(\boldsymbol{i},\boldsymbol{j})^2$$

2. Correlation:

Is an edge information. Digital image association and tracking is an optical method that employs a tracking and image registration techniques for accurate 2D then 3D measurements of changes in images. Correlation is calculated as:

$$r = \frac{1}{n-1}\sum\left(\frac{x-\bar{x}}{s_x}\right)\left(\frac{y-\bar{y}}{s_y}\right)$$

3. Energy:

Energy is defind as the unkind sequared value of the signal.

It is a thickness&intensity. Energy is calculated as

$$E = \sum_{i=0}^{N-1}\sum_{j=0}^{N-1} P(i,j)^2$$

4. Homogeneity:

Homogeneity is a matching level. It is a relate the validity of the convenient assumption of an overall dataset. Homogeneity is calculated as,

$$\sum_{i,j=0}^{N-1} \frac{P_{i,j}}{1+(i,j)^2}$$

5. Mean:

Mean is calculated as,

$$\bar{X} = \frac{\sum x}{N}$$

6. Standard deviation:

Find the difference of each number in the pixels. Standard deviation is calculated as,

$$SD = \sqrt{\frac{(\sum(x-\bar{x})^2}{n-1}}$$

7. Mean ratio:

Mean ratio is calculated as,

$$\frac{\textbf{Mean}}{\textbf{Standard deviation}}$$

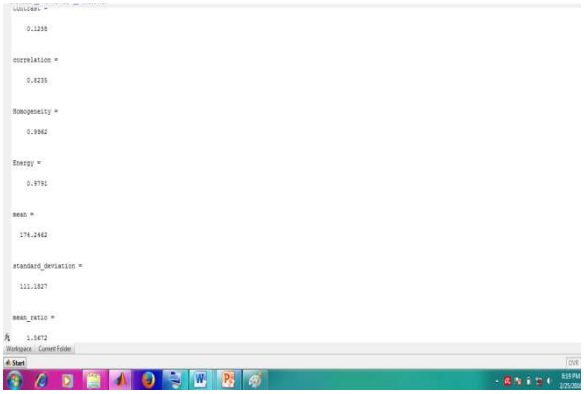

Fig6: Screen shot for face extraction.

F. Face recognition:

In machine knowledge, support vector machines (SVMs, also support vector networks) remain supervised knowledge models with associated learning algorithms that study data used for classification and regression analysis.

Given a set of training examples, each marked used for belonging to single of double categories, an SVM training algorithm builds a model that assigns new examples keen on one category or the extra, making it a non-probabilistic binary linear classifier.

An SVM model stands a representation of the samples as points in universe, mapped so that the examples of the separate categories are divided by a clear gap that stands as wide as possible.

Original examples are then mapped into that same space and predicted to belong on the way to a classification based on which side of the gap they fall on.

5 CONCLUSION

We have seen in this report the complexity of the face detection task. Many methods can be used existing a precise context for each of those methods. We have chosen an intermediate method between the image based and the feature based detection method. A face detection system has been developed using a Boosting algorithm and simple rectangular Haar-like features. This method presents many advantages in comparison with other methods for detecting faces.

REFERENCES

[1] Sima Taheri, “Face Recognition Across Non-Uniform Motion Blur, Illumination, an Pose” IEEE trans. image process., vol. 24, no. 7, july 2015.

[2] P. Vageeswaran, K. Mitra, and R. Chellappa, “Hand-Dorsa Vein Recognition by Matching Local Features of Multisource Keypoints,”IEEE Trans.Image Process., vol. 22, no. 4, pp. 1362–1372, Apr. 2014.

[3] R. Gopalan, S. Taheri, P. Turaga, and R. Chellappa, “Transform-Invariant PCA: A Unified Approach to Fully Automatic Face Alignment, Representation, and Recognition,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 34, no. 6, pp. 1220–1226, Jun. 2014.

[4] G. Tzimiropoulos, S. Zafeiriou, and M. Pantic, “Subspace learning from image gradient orientations,” IEEE Trans. Pattern Anal. Mach. Intell, vol. 34, no. 12, pp. 2454–2466, Dec. 2012.

[5] M. Nishiyama, A. Hadid, H. Takeshima, J. Shotton, T. Kozakaya, and O. Yamaguchi, “Evaluation of face recognition techniques using PCA, wavelets and SVM,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 33, no. 4, pp. 838–845, Apr. 2010.

[6] A. Gupta, N. Joshi, L. Zitnick, M. Cohen, and B. Curless, Co-Occurrence based Statistical Approach for Face Recognition,” in Proc. Eur. Conf. Comput. Vis., 2009, pp. 171–184.

[7] M. Šorel and F. Šroubek, “Face Recognition System Using SVM Classifier and Feature Extraction by PCA and LDA Combination,” in Proc. 16th IEEE Int. Conf. Image process., Nov. 2009, pp. 157–160.

[8] Q. Shan, J. Jia, and A. Agarwala, “Three Dimensional Face Recognition Using SVM Classifier,” ACM Trans. Graph., vol. 27, no. 3, pp. 73:1–73:10, Aug. 2008.

[9] H. Hu and G. de Haan, “Wavelet Frame Accelerated Reduced Support Vector Machines,” in Proc. 9th Int. Conf. Adv. Concepts Intell. Vis. Syst., 2007, pp. 461472.

[10] T. Ahonen, A. Hadid, and M. Pietikainen, “Facial Expression Recognition in Image Sequences Using Geometric Deformation Features and Support Vector Machines,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 28, no. 12, pp. 2037–2041, Dec. 2006.

[11] R. Fergus, B. Singh, A. Hertzmann, S. T. Roweis, and W. T. Freeman, “Removing camera shake from a single photograph,” ACM Trans.Graph., vol. 25, no. 3, pp. 787794, Jul. 2006.

[12] K.-C. Lee, J. Ho, and D. Kriegman, “An Automatic Face Recognition System Based on Wavelet Transforms,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 27, no. 5, pp. 684–698, May 2005.