An Automatic Face Recognition System Based On Adaptive Wavelet Transforms

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Abstract: Face recognition is initial as an forceful search area straddling many improvements such as image processing, shape recognition, computer apparition and neural networks. Face recognition technology has many profitable and law implementation applications. In this plan we are presenting an automatic organization based on Adaptive wavelet transforms for face recognition. A series of wavelet decompositions together with changed threshold types and segmentation procedures must remained applied in instruction to explore the greatest performances. Haar, Gabor and 9/7 wavelet sieves we will implement as a amount of the planned procedures due to their simplicity, suitability and regularity for face recognition using multi-resolution approaches.

In current years, face recognition has remained the subject of concentrated research. With the current apparent world security condition, governments as well as businesses need dependable methods to precisely identify persons, without excessively infringing on rights to privacy or requiring significant compliance on the amount of the individual being recognized. Face recognition provides an acceptable solution to this problem.

Index Terms: Median Filter, Wavelet Transform.

I. INTRODUCTION

Face recognition consumes recently conventional significant attention. It is greatly motivated by the requirements of military, commercial, and public security applications. However, the bottleneck of recognition is wide range variations of humanoid faces due to illumination, shift, pose, occlusion, and expression, which result in a greatly multifaceted distribution. Generally, the solution is to extract facial geographies healthy in contradiction of these deviations before discriminant analysis or classification. However, how to efficiently extract these topographies from facial image leftovers an open issue.

Another popular kind of studies aim to extract local topographies healthy against environmental variations from facial images. Certain of them devote to find good descriptors for the appearance of native facemask regions, e.g., local binary patterns (LBP) , however, they need prevision of local regions which may affect feature extraction. Some of them utilize wavelet investigation that has moral features of spatial-frequency localization to notice facemask regular construction, e.g., the discrete wavelet transform (DWT) , Gabor wavelet transform(GWT) . However, the deficiency of shift invariance makes DWT difficult to characterize a pattern from the wavelet constants.

II. LITERATURE SURVEY

A multitude of techniques have been applied to face recognition and can be separated into two categories

- Geometric feature matching and
- Template matching.

Geometric feature corresponding involves segmenting the characteristic features of the face, eyes, nose, mouth, and extracting colourful information about them such as their widths and heights. Relations between these measures can then be deposited for each person and equated with those from known individuals.

- Template matching is a non-segmentation method to face recognition.
- Each face is pickled as a two dimensional collection of intensity values, which is then equated with other facial arrays.
- Initial approaches pickled faces as ideas in very great dimensional interplanetary and planned the Euclidean distance among them.
**III. BLOCK DIAGRAM**

The first step of any vision system is image acquisition. For image acquisition firstly we capture the image using the camera. For capturing we have used 8M pixel camera for image resolution and 4M pixel camera for video resolution. The specification of camera is high quality CMOS sensors, high superiority 5G wide angle lens. The camera has 4x digital zoom. The video format is RGB 24 bit. The frame rate is 30 farm per second. The image acquisition involves the pre-processing such as image scaling, filtering etc. The image pre-processing can expressively increases the reliability of an image. In pre-processing we reduce the noise and increase the contrast of image.

**A. MEDIAN FILTER**

Median filter is a nonlinear process in image dispensation to diminish ‘salt and pepper’ noise. The median filter swaps the vital value of M by N neighborhood with its media value.

**B. WAVELET ANALYSIS**

Images are treated as two dimensional signals that change horizontally and vertically, thus 2D wavelet analysis requirement be used for images. 2D wavelet study uses the identical ‘mother wavelet’ but needs an additional step at every level of decomposition. The 1D analysis filtered out the high frequency information from the low frequency information at every equal of decomposition. In 2D, images are consider matrixed with N rows and M columns. At every level of decomposition the parallel data filtered firstly then estimate and feature produced from this are filtered on column.

**IV. ALGORITHM**

1. Start
2. Acquisition of Face image
3. Image Preprocessing
   - Noise reduction
   - Contrast Adjustment
4. Image Alignment
5. Image Decomposition in multiple resolutions using Adaptive wavelet transform by using following wind’s
   - Hair
   - Db.
6. Face image segmentation in following parts
   - Eyes
   - Nose

**Figure 1: Block diagram Of Face Recognition**

**Figure 2: Median filter**

Median filter divide this image in fixed size of box that is known as neighborhood. If the neighborhood does not have an exact center then these block has a bias forward the upper left center and then places the median rate there.

**Figure 3: Secondary median filter**

**Figure 4: Two level wavelet transform**
• Lips
• Hairs
✓ Feature Extraction
✓ Storing Features in Database.
✓ For testing repeat steps 1-8 and match aligned testing features with stored database features using SVM classifier.
✓ Stop.

V. S. ADVANTAGES
✓ Highly Accurate Due to perfect alignment correction
✓ Less time Complex as performed in low resolutions.

VI. APPLICATIONS
Personal Authentication.
Attendance system in collage, banks etc.

VII. CONCLUSION
We have purposed a new face image compression scheme based on a Redundant Tree-Based Wavelet Transform (RTBWT). We have learnt transforms from training set containing aligned face images and use it as a redundant dictionary when we encode the images by applying sparse coding on them. Improved quality results are obtained by Adaptive Wavelet Transform.

VIII. RESULT
Face is firstly splits into sub-blocks or small parts and then it will compressed. The ORL standard face database is chosen in this simulation experiment. Simulate on the platform of Matlab7.5. The ORL standard face database consists of 400 face images attained from 40 people. Each people have 10 images of different expression or gesture. The resolution rate of the image is 112×92 and the gray scale is 256.

![Figure 5: Final result](image-url)

REFERENCES