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Local Binary Patterns and Its Application to Facial Analysis

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Abstract: **This paper focuses on the Local Binary Patterns and its application to facial analysis. LBP is a non-parametric descriptor and used to extract, analyze, recognize and classify the different modality images. It summarizes the local patterns of image characteristics efficiently. In image processing, we have to extract features from a set of different texture or facial images, the Local Binary Pattern is a descriptor to extract, analyze, recognize and classify that data. There are detection, face representation, face detection and face recognition processes needed to analyze a face, from which the data obtained of different faces are comparatively checked according a specific exact facial image of person. This technique is applied at biometric machine and at other purposes to recognize an authentic face image. This paper facial analysis process and different local binary pattern techniques applied for facial detection and recognition are extensively reviewed.**

Keywords: **Local Binary Pattern, LBP, Face Detection, Recognition.**

I. INTRODUCTION

The progress in machine learning has led to methods that are adaptable to variability in images. There are so many constraints on the type of input required for quality results. This indicates how good descriptors are needed and in demand. The texture of images refers to appearance, structure, arrangement of the parts of an object within the image. Images used for diagnostic purposes in clinical field are digital and most probably two dimensional. In principle it is a technique for evaluating the position and intensity of signal features that means pixels and their gray level intensities. The distribution of these pixels can be computed to produce mathematical parameters which characterize the texture type and thus the underlying structure of objects shown in image. These values are also known as texture features [1].During that time studies showed much important information contained in the distributions of feature values were lost through the usage of these single texture measures. These texture classification methods assume,that unknown samples to be classified are always identical to the training samples with respect to scale, orientation and gray-scale properties. Real world textures are not like that, they are unpredictably subjected to varying illumination conditions and arbitrary spatial rotations constantly**.** This showed how unreliable past texture classifications were and their incompetence in handling real world images. Not to mention, the degree of computational complexity in their algorithms is too high [2]. A very helpful suggestion for future research from then is to develop texture measures which incorporate invariance to real-world factors such as orientation and scale, and can be classified with a low-computational complexity [3]. From that theory the LBP was developed.

1.1 Local Binary Patterns

LBP is applied in computer vision and image processing. It is used for textual description and facial description [4].It is feature extraction descriptor.LBP is introduced by a research paper “A comparative study of texture measures with classifications”Pattern recognition in 1996. This operator acts as an image operator which transforms an image into an array or image of integer labels describing small scale appearance (textures) of image. These label directly or their statistics are used for further analysis. LBP is found as a powerful feature for texture classification[5]. It is determined that when LBP is combined with histograms of (HOG) descriptor, it improves detection performance on some data sets.Using LBP and combining it with histograms, face images with a simple data vector are represented. As LBP is a visual descriptor it can also be used for face recognition tasks.

Local Binary Pattern is an efficient texture and facial operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. To calculate the LBP descriptor, input color image to grayscale is converted, since LBP works on grayscale images. For each pixel in the grayscale image, a neighborhood is selected around the current pixel as in figure-1, and then LBP value for the pixel using the neighborhood is calculated. After calculating the LBP value of the current pixel, then the corresponding pixel location in the LBP mask is updated with the LBP value. Texture has locally two complementary aspects pattern and its strength.it works in a 3*3 pixel [6].

1.2 GrayscaleImage to LBP Mask and Threshold Value

Given a grayscale image I of size n × m pixels and I (g) denotes the gray level of the gth pixel in the image I. The LBP operator is calculated at each pixel by evaluating the binary differences of the values in a small circular neighborhood (with radius R) around the value of a central pixel, g_c where g_c : gray value of the center pixel; g_p: gray values of the circularly symmetric neighborhood g_p ($p = 0,..., P = 1$); P is image pixels in the circle of radius R($R > 0$); 2^p binomial factor for each sign f_1 ($g_p - g_c$). If an image is considered as I(x, y) and let g_p denote the gray value of a sampling point with coordinates Xp, Yp in an evenly spaced circular neighborhood of P sampling points and radius R around point x_c, y_c:

$$g_p = I(x_p, y_p),\ p = 0,\dots,\ P-1 \qquad (1)$$

$$x_p = x_c + R\cos(2\pi p/P), \qquad (2)$$

$$yp = y_c - R\sin(2\pi p/P) \qquad (3)$$

Assume that the local texture T of the image I(x, y) is characterized by the joint distribution of gray values of P+1 (P>0) pixels [7]. Moreover, let gc denote the gray level of the local texture neighborhood center pixel x_c, y_c)

i.e. $g_c = I(x_c, y_c)$: $T = t(g_c, g_0, g_1,\dots,g_{p-1})$ (4)

The value of the LBP code of a pixel (x_c,y_c) is expressed in equation (5) as given below

$$LBP_{P,R} = \sum s\,(g_p - g_c)\, 2^P \quad \{\text{value from } p=0 \text{ to } P-1\} \qquad (5)$$

$$S(x) = \{1 \text{ if } x \geq 0;\ 0 \text{ if else}\}$$

For example if we have 70 as threshold value others its neighborhood values, its sample difference and threshold representation is shown in figure-1.

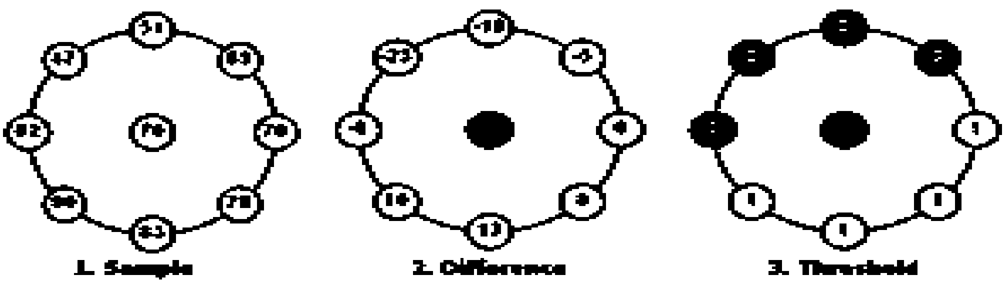

Figure 1: Sample, difference and threshold representation

1.3 LBP Procedure and Calculation Method

LBP operator is rotation invariant to gray scale texture. The extraction of LBP operator comprises two main steps: one is thresholding and second is encoding step. The thresholding step extract the information about the local binary difference (1or 0) by comparing the circular neighbor pixels value with central pixel in a patch of the image.In local binary patterns the two-dimensional textures can be described by two complementary local measures: spatial structure (pattern) and contrast (the amount of local image texture). In terms of gray-scale and rotation invariance, these two properties are an interesting pair; spatial pattern is affected by rotation of the texture but contrast is not and contrast is affected by the grayscale though spatial pattern is not. Therefore if a texture descriptor is capable in separating the texture's pattern information from its contrast, then invariance to monotonic gray scale changes can be obtained by the following method.

First of all convert an image to grayscale. For each pixel in the grayscale image, select a neighborhood of size r, say three, surrounding the center pixel. For each of the pixel's three by three neighbor compare the center value and its neighbor value. If the neighbor values are greater than center, record 1 else record 0. Convert the binary operated values to a digit. The 8 surrounding neighbor pixels are in clockwise or counter-clockwise. The starting pixel can be any of the 8 neighborvalues as long as it is consistent.Let LBP value to be 0 and then if the binary value of the starting pixel is one, add 2^0 to the LBP value, else 0. If the next binary value is one, add 2^1, else add 0. If the next binary value is one, add 2^2, else add 0. Repeat this process until the last pixel.For example in the following graph below, as in figure-2, setting top left corner as the starting pixel, and ordering the neighbor pixel values in clock wise manner, we can convert the binary operated values to a digit as:

$$141 = 2^0 + 2^2 + 2^3 + 2^7$$

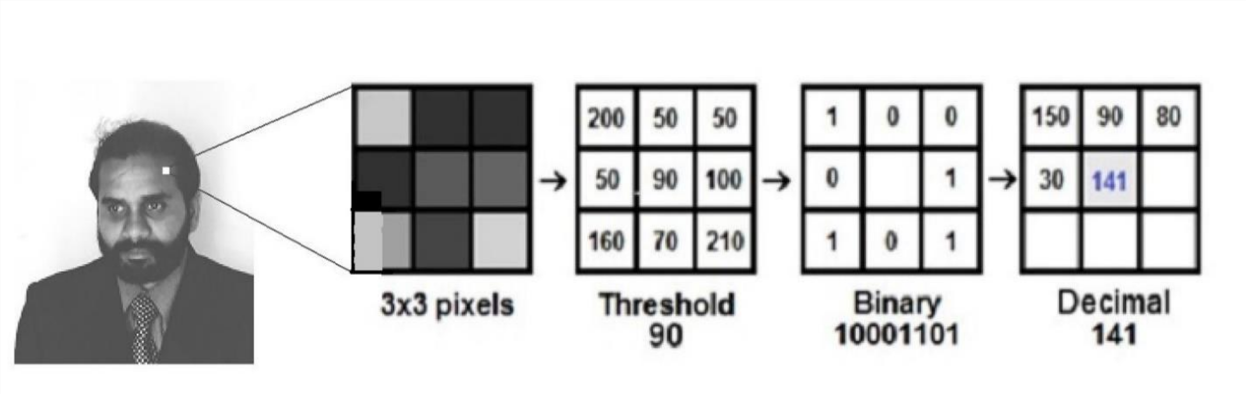

Figure 2: LBP graph with binary values according to threshold

One advantage of LBP is that it is illumination and translation invariant. An 8 point neighborhood is selected but most implementations use a circular neighborhood as shown below. In the code, a circular neighborhoodis used as in figure-3 below.

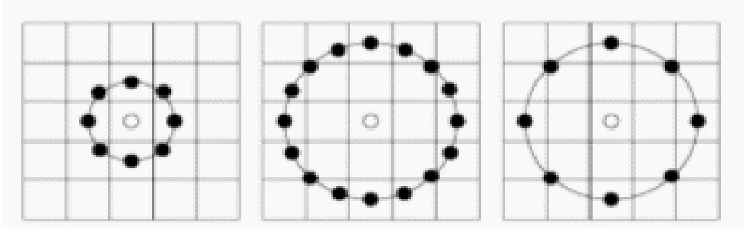

Figure 3: Circular Neighborhood

The original LBP algorithm was further optimized to give better results. One such implementation is the uniform LBP. LBPis used successfully for face recognition [8].The newly proposed texture descriptors provide a progress in texture analysis by means of their high discriminative properties and computational efficiency. LBP and its variants outperformed than other reported descriptors in the field of texture analysis based applications [9]. This operator is extended as 2D plus time voxel version of LBP [10], called VLBP, and used them successfully for facial gesture recognition.

1.4 Spatiotemporal LBP

The original LBP operator was defined to only deal with the spatial information. Later, it was extended to a spatiotemporal representation for dynamic texture analysis. For this purpose, the so-called Volume Local Binary Pattern (VLBP) operator is proposed. The idea behind VLBP consists of looking at dynamic texture as a set of volumes in the (X,Y,T) space where X and Y denote the spatial coordinates and T denotes the frame index (time). The neighborhood of each pixel is thus defined in three dimensional spaces. Then, similarly to LBP in spatial domain, volume textons can be defined and extracted into histograms [11]. Therefore, VLBP combines motion and appearance together to describe dynamic textures.

1.5 Uniform Local Binary Pattern

LBP features are combined with HOG features to address the problem of partial occlusions in the problem of human detections [12].Another important case of LBP is the uniform LBP. An LBP descriptor is called uniform if it contains at most two circular bitwise 0-1 transitions. Uniformity measure U (pattern) is the number of bitwise transitions from 0 to 1 or vice versa. A local binary pattern is called uniform if its uniformity measure is at most 2. That is transitions between 0 and $1 \leq 2$. A uniform pattern has no transition or two transitions.There are main reasons for considering only uniform pattern, one that in real world scenario most of the texture have uniform in nature and themselves are more stable i.e. less affected by noise and another reason is, because only consider uniform pattern so the minimum samples of LBP are reliable to recognized the texture pattern [13].

II. FACIAL ANALYSIS

Face analysis is identifying a face, its representation, and description of a face, face detection and recognition concepts of face. Face is a typical multidimensional structure and needs good computational analysis for recognition. Since a long time, LBP was only used for texture classification but now it is also used to solve some of the common face recognition issues. Facial representation is the process of identifying a person in a digital image or video and showing their authentication identity.

2.1 Face Identification

Identification is a one to many matching process that compares a query face image against all the template images inside the face database in order to determine the identity of query face.The identification of a person is becoming highly important as the ID cards, punch, secret password and PIN are used for personal Identification. The ID can be stolen, passwords can be forgotten or cracked. Additional security barriers can be provided using any one of the biometrics features. LBP-based approaches have been proposed to solve certain face recognition problems, such as illumination and expression variations. It provides good results in terms of both speed and discrimination performance. The facial image texture is divided into several small blocks, from which the feature histogram of each region is constructed separately; therefore, the LBP histogram of each block will be combined to obtain a concatenated vector (a global histogram of face). The similarity (distance) can then be measured by using the global histogram of different images.

2.2 Facial Representation

Facial representation consists in deriving a set of relevant features from original images to describe faces, in order to facilitate effective machine-based recognition. Good facial features are desired to have the some properties. First they can tolerate within-class variations, while discriminate different classes well; second they can be easily extracted from raw images to allow fast processing; finally, they lie in a space with low dimensionality to avoid computationally expensive classifiers. Since it was introduced for face representation, LBP has proved to be an efficient descriptor for facial image analysis. It fulfills the aforementioned criteria and recent years have witnessed increasing interest in LBP features for facial representation.

2.3 LBP Based Face Description

A face image can be considered as a composition of the micropatterns described by LBP. One can build an LBP histogram computed over the whole-face image. However, such a representation only encodes the occurrences of micropatterns without any indication about their locations. To consider the shape information of faces, divide face images into local regions, from which local LBP histograms can be extracted, and then to concatenate them into a single, spatially enhanced feature histogram. The resulting histogram encodes both the local texture and global shape of face images.

2.4 Face Detection

Although lot of progress has been made in domain of face detection and recognition for security, identification and attendance purpose, but still there are issues hindering the progress to reach or surpass human level accuracy. These issues are variations in human facial appearance such as; varying lighting condition, noise in face images, scale, pose etc. Feature extraction is the first stage in detection and recognition of the image processing and computer vision. The aim of face detection is to determine the locations and sizes of human faces in digital images. Firstly used LBP for face detection to describe low-resolution faces, a four-neighborhood LBP operator LBP (4,1) is applied to overlapping the small regions. A hybrid method to address face detection under unconstrained environments is proposed. The method first searched for the potential skin regions in an input image to avoid scanning the entire image. Then, a coarse-to-fine strategy is employed to determine whether the scanned regions are faces or not. The support vector machine (SVM) classifier is adopted to discriminate faces from non faces [14].

2.5 Facial Expression Analysis

Machine-based facial expression recognition aims to recognize facial affect states automatically, and may depend on both audio and visual clues [15]. Most of thestudies purely based on facial motion and facial features visual information only consider the prototypical emotional states, which include seven basic universal categories, namely, neutral, anger, disgust, fear, happiness, sadness, and surprise. More precisely, at the coarse stage, a seven-class problem can be reduced to a two-class one, while at final stage, a K-NN classifier perform the final decision.

2.6 Face Recognition

The interest in theories and algorithms for face recognition has been growing rapidly. Video surveillance, criminal identification, building access control, and unmanned and autonomous vehicles are just a few examples of concrete applications that are gaining attraction among industries. Face recognition aims to identify or verify a person from a digital image or a video sequence.Various techniques are being developed including local, holistic, and hybrid approaches, which provide a face image description using only a few face image features or the whole facial features.The biometric is the study of physical or behavioral characteristics used for identification of a person. Facial recognition system (FRS) is the fastest growing biometric technology [16]. Human physical characteristics like fingerprints, face, hand geometry, voice and iris are known as biometrics. These features are used to provide an authentication for computer based security systems. LBP in face recognition with nearest neighbor (NN) classifier and chi-square distance as the dissimilarity measure is proposed by earlier researchers. It is investigated whether the good results are due to the use of local regions or the discriminative capacity of LBP methodology. The works in [17] proposed a convolutional neural network (CNN) as a solution of the face recognition problem in unconstrained environments. Deep learning provides much more powerful capabilities to handle two types of variations; it is essential to learn such features by using two supervisory signals simultaneously (i.e., the face identification and verification signals), and the learned features. A rigorous empirical evaluation of CNN based on face recognition systems is proposed [18].

2.7 Face Recognition Algorithm

To implement the face recognition algorithm, LBP is proposed that use LBP operator which summarizes the local special structure of a face image.Algorithm- Input: training image, output: feature extracted from face image and compared with center pixel and recognition with unknown face image set as from [19].

- Initialize temp = 0. For each image I in the training image set.
- Initialize the pattern histogram, H=0. For each center pixel $t_c \varepsilon$ I
- Compute the pattern label of t_c LBP (1). Increase the corresponding bin by 1
- END FOR. Find the highest LBP feature for each face image and combined into single vector.
- Compare with test face image. If it matches it most similar face in database then successfully recognized.

2.8 Feature Extraction Phase

The LBP algorithm is a method of damage reduction technology that represents a discrimination of an interesting part of the face image in a compact feature vector. When the pre-processing phase is achieved, the LBP algorithm is applied to the segments in order to obtain a specific feature histogram. A focus on the feature extraction phase is essential because it has an observable impact on recognition system efficiency. The application of suitable neighbor-sets for different values of (P, R) needs to be done with almost cares. Facial feature extraction is performed with local binary pattern and local ternary pattern along with illumination normalization. To suppress the effect of illumination a gradient based illumination normalization technique is used in the preprocessing stage [20]. Face image is split into small blocks and LBP histograms are computed for each sub block and concatenated into a single feature vector. Local ternary patterns are noise resistant 3-state version of LBP. Feature vectors are used for further recognition task.

2.9 Learning or Modeling Phase

Learning or modeling LBP histogram is used to fit a model of the appearance of face images, so that discrimination between the faces of different subjects inside the database can be determined. In order to improve processing time, the extracted distance vectors are sorted in increasing order. The learning step forms tightly packed conglomerates of visual feature histograms at detailed scales. These are determined by a form of configuration feature set, implying that the processing part reveals the similarity between features histograms. The characteristics of the processing part will be made explicit during matching in the classification phase.

2.10 K-Nearest Neighbor Classifier (K-NN)

K-NN is the simplest of all machine learning and classification algorithms, and stores all available cases and classifies new cases based on a similarity measure [21]. Therefore, the value K is used to perform classification by computing the simple histogram similarities. In this context, good K value is selected by applying a K-fold cross-validation approach in order to estimate the optimum K. The greater accuracy of K-nearest neighbor (K-NN) in image classification problems is highlighted; it is commonly used for its easier interpretation and low calculation time. The main aim of LBP and K-NN in the work is to extract features and classify different LBP histograms, respectively, in order to ensure good matching between the extracted features histograms and provide a greater identification rate.

III. DIFFERENT LBP TECHNIQUESS FOR FACIAL ANALYSIS

Today's identifying a person using a face is a standard biometric approach to distinguishing an individual from others. So techniques are required to identify a face must be quick and sufficiently enough to work in real time. But there are many difficulties within the execution of face identification in low lighting condition. Recognition face technology is very fast at this time, there are many face recognition applications that have been applied to devices such as smartphones, time attendance machines, room access permits, location surveillance, and others.

3.1 LBP and Local Directional Pattern based Facial Recognition

Identification is an essential step in face recognition, in which one of the typical of a class and authoritative application in visual sensor network. .Facial images also contain a great deal of redundant information, which negatively affects the performance of the recognition system. A novel approach is proposed [22]for recognizing facial images from facial features using feature descriptors, namely local binary patterns (LBP) and local directional patterns (LDP). This research work consisted of three parts, namely face representation, feature extraction and classification. The useful and unique features of the facial images are extracted in the feature extraction phase. In classification, the face image is compared with the images from the database. The face area is divided into small regions from which local binary and directional patterns (LBP/LDP) histograms are extracted and concatenated into a single feature vector (histogram).

3.2 Circular Derivative LBP for Facial Expression Recognition

A novel feature extraction technique used for facial expression recognition (FER) is called circular derivative local binary pattern (CDLBP). Motivated by uniform local binary patterns (u LBPs) which exhibits high discriminative potential at a reduced data dimension of the original LBP feature vector, CD-LBP feature descriptors are extracted as a result of binary derivatives of the circular binary patterns formed by LBPs [23].Seven datasets consisting of CD-LBP feature vectors are derived from the Japanese female facial expression (JAFFE) database. Then these fed individually in a K-nearest neighbor classifier and evaluated with respect to their respective recognition rate and feature vector size. The experimental results demonstrate the relevance of the proposed feature description especially when performance metrics such as recognition accuracy and running time are considered.

3.3 Enhanced LBP for Face Spoofing Detection

Spoofing is defined as the capability of making fool of a system that is biometric for finding out the unauthorized customers as an actual one by the various ways of representing version of synthetic forged of the original biometric trait to the sensing objects. In order to guard face spoofing, several anti-spoofing methods are developed to do liveliness detection. The various techniques for detection of spoofing make the use of LBP i.e. local binary patterns that make the difference to symbolize handcrafted texture features from images, whereas, recent researches have shown that deep features are more robust in comparison to the former one [24].

3.4 LBP Histogram for Face Recognition

A system that is using LBP Histogram algorithm for identifying a face is proposed [25]. It can recognize both front and side faces and upgrade the value of poor enlightened picture and also expands the recognition rate in real time.[26] Indeed, after the appearance of the LBP operator, several renowned extensions and modifications of LBP have been proposed [26] in the literature to the point that it can be difficult to recognize their respective LBP-related strategies, strengths and weaknesses according to a given application, and there is a need for a complete comparative study in face recognition application.There are a lot of weaknesses in facial recognition so that implementation is needed so that it is not easily hacked with the local binary pattern histogram and SHA256 bit methods in a face recognition system that uses a webcam in real time by combining the two methods [27].

3.5 Applying LBP, HOG, CNN for Face Detection and Recognition

The feature extraction supports the conversion of the image into a quantitative data. This converted data can be used for labelling, classifying and recognizing a model [28]. The performance of such feature extraction techniques such as LBP, Histogram of oriented gradients (HOG) and Convolutional neural network (CNN) technique are applied to detect and recognize the face. The experiments conducted with a data set addressing the issues like pose variation, facial expression and intensity of light. The efficiency of the algorithms is evaluated based on the computational time and accuracy rate which provides better results [29].Face recognition is a practical application of pattern recognition and remains a compelling topic in the study of computer vision. However, in real-world face recognition systems, interferences in images, including illumination condition, occlusion, facial expression and pose variation, make the recognition task challenging**.**

3.6 LBP for Face Detection in Campus Surveillance and Attendance Management System

The schools and university campuses has an increasing demand for a real-time monitoring and quick responding database that tracks the student activities. In many educational institutes comprising of several branches and streams that share a single campus, there is a possible chance of intrusion and unauthorized entry. A surveillance system that monitors , tracks these activities and offers to its privileged users a response in real-time [30]. It can also be used to track the attendance of students in an automated fashion. Identification is an essential step in face recognition, in which one of the typical of a class and authoritative application in visual sensor network. Visual perception is one of the physical measurements based on secured features. Face identification is a demanding assignment, because it has to scan and match against a library of known faces e.g. lighting condition, different posture and various kind of body languages. A new method is presented using LBP combined with advanced image processing techniques such as contrast adjustment, bilateral filter, histogram equalization and image blending to address some of the issues hampering face recognition accuracy so as to improve the LBP codes, thus improve the accuracy of the overall face recognition system [31]. This showed that the method is very accurate, reliable and robust for face recognition system that can be practically implemented in real-life environment as an automatic attendance management system.

3.7 Local Descriptor for Face Recognition Based on Strings

For this method a face image is first divided into non overlapping sub regions from which the strings (words) are extracted using the principle of chain code algorithm and assigned into the nearest words in a dictionary of visual words (DoVW) with the Levenshtein distance (LD) by applying the bag of visual words (BoVW) paradigm [32]. As a result, each region is represented by a histogram of dictionary words. Histograms are then assembled as a face descriptor. This methodology depends on the path pursued from a starting pixel and do not require a model as the other approaches from the literature. The information of the local and global properties of an object is obtained and recognition is performed by using the nearest neighbor classifier with the Hellinger distance (HD) as a comparison between feature vectors. The experimental results on the ORL and Yale databases demonstrate the efficiency of the proposed approach in terms of preserving information and recognition rate compared to the existing face recognition methods.

3.8 LBP for Image Retrieval and Combining LBP with Multi-mirror Symmetry for Images

A novel and robust FR method is proposed by combining multi-mirror symmetry with local binary pattern (LBP), namely multi-mirror local binary pattern (MMLBP) [33]. To enhance FR performance with various interferences, the MMLBP can adaptively compensate lighting under heterogeneous lighting conditions, and generate extracted image features that are much closer to those under well-controlled conditions (i.e., frontal facial images without expression). The symmetrical singular value decomposition representation (SSVDR) algorithm utilizing the facial symmetry and a state-of-art non-LBP method, the MMLBP method is shown to successfully handle various image interferences that are common in FR applications without preprocessing operation and a large number of training images. The proposed method is validated with four public data sets. According to this analysis, the MMLBP method is demonstrated to achieve robust performance regardless of image interferences.LBP technique is extensively used to extract texture features; however, it takes more execution time as it considered all the 8 bits while calculating LBP values [34]. A modified version of the LBP (mLBP) technique is proposed that uses only the 4 most significant bits.

3.9 Orthogonal difference LBP for face analysis

This research introduces the novel descriptor for Face analysis called as orthogonal difference-Local binary pattern (OD-LBP). In OD-LBP, initially the 3 gray level differences are computed for each orthogonal position (of 2 groups, in 3×3 pixel window) by subtracting the 2 closest neighborhoods and the center pixel from the respective orthogonal value. Then these respective gray level differences are compared with the value produced after employing the novel comparison method. Finally the 1×24 size row vector is produced by concatenating the binary patterns produced from both the orthogonal groups. Eventually the 24 bit row vector is split into three 8 bit binary patterns from which the 3 OD-LBP codes are produced. By employing this concept for each pixel position eventually results in the 3 OD-LBP transformed images. All the 3 transformed images are then divided into 3×3 sub-regions for histogram extraction. The combined sub-regional histograms from all the transformed images are the entire feature size of the OD-LBP descriptor. To achieve the compact feature representation PCA is applied further and then classification is performed by the SVMs. The entire concept is tested on 5 challenging databases which include ORL, GT, JAFFE, MIT-CBCL and Yale. The proposed descriptor (i.e. OD-LBP) achieves very promising results on all 5 databases as it comprehensively outperforms the other 10 state of art descriptors LBP, CS-LBP, 6×6 MB-LBP, OC-LBP, MBP, HOG, ELBP, OS-LTP, WCLBP and RLBP on majority of sub-sets [35].

3.10 Local Binary Patterns based face recognition using Vector support Machine

LBP is a non-parametric descriptor whose purpose is to effectively summarize local image configurations. It has generated increasing interest in many aspects including facial image analysis, vision detection, facial expression analysis, demographic classification, etc. in recent years and has proven useful in various applications. In this research they represent local binary pattern based face recognition (LBP) technology using a Vector Support Machine (SVM). Combine the local characteristics of LBP with universal characteristics so that the general picture characteristics are more robust. To reduce dimension and maximize discrimination, super vector machines (SVM) are used. Screened and Evaluated (FAR), FARR and Accuracy Score (Acc), not only on the Yale Face database but also on the expanded Yale Face Database B datasets, the test results indicate that the approach is accurate and practical, and gives a recognition rate of 98 %.[36].

IV. CONCLUSIONS

There are many techniques available to analyze the texture and facial representation. LBP is much efficient easy to understand and implement technique for feature extraction and description of texture image many researcher implemented LBP and its other variants for facial analysis in daily life applications. The different datasets are used for implementations of these algorithms.Local feature based methods extract features from local points or patterns. There are many different forms of LBP patterns which are suitable for different application in engineering and other than engineering fields. Each and every technique has its unique benefit. According to time many researchers improved or combined available techniques for different facial detection recognition applications. The different datasets are used for implementations of these techniques. These LBP techniques are applied for face detection and recognition to solve the biometric and other authenticity problems in different areas of our daily life applications. To select a good LBP descriptor to exploit facial images in various fields of image processing, face recognition measures should be capable to detect different facial properties and computational complexity to make the technique realistic for technical purpose. For this local binary pattern and its different other variants applied to face recognition problems which provide better and efficient results.

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