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Local Directional Ternary Pattern for Facial Expression Recognition

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ABSTRACT

In this work we proposes a novel local feature descriptor, local directional number pattern (LDN), for face analysis, i.e., face and expression recognition. LDN encodes the directional information of the face's textures (i.e., the texture's structure) in a compact way, producing a more discriminative code than current methods. We compute the structure of each micro-pattern with the aid of a compass mask that extracts directional information, and we encode such information using the prominent direction indices (directional numbers) and sign—which allows us to distinguish among similar structural patterns that have different intensity transitions. We divide the face into several regions, and extract the distribution of the LDN features from them. Then, we concatenate these features into a feature vector, and we use it as a face descriptor.This technique focuses on the selection of localized features from the facial expression images and discriminate their classes on the basis of regression values i.e. partial F-test. The results shows better conventional techniques in terms of robustness in suitable feature selection and classification. The most prominent features were selected by proposing a robust technique called stepwise linear discriminantanalysis focuses on selecting the localized features from the activity frames and discriminating their class based on regression values. The purpose of a feature extraction technique is to extract the localized features from faces that the previous feature extraction techniques were limited in analyzing.

I. 1.INTRODUCTION

Facial expression recognition has potential applications in different aspects of day-to-day life not yet realized due to absence of effective expression recognition techniques. This paper discusses the application of Gabor filter based feature extraction in combination feed forward neural networks (classifier) for recognition of seven different facial expressions from still pictures of the human face. The study presented here gives simple method in facial expression recognition. Facial expression recognition has potential applications in different aspects of day-to-day life not yet realized due to absence of effective expression recognition techniques. This paper discusses the application of Gabor filter based feature extraction in combination feed forward neural networks (classifier) for recognition of seven different facial expressions from still pictures of the human face. The study presented here gives simple method in facial expression recognition.

II. DOMAIN EXPLANATION

2.1 Image processing

An image is an array, or a matrix, of square pixels (picture elements) arranged in columns and rows.

In a (8-bit) greyscale image each picture element has an assigned intensity that ranges from 0 to 255. A grey scale image is what people normally call a black and white image, but the name emphasizes that such an image will also include many shades of grey.

III. EXISTING SYSTEM

In existing system, several methods are used to extract image face features vector, which presents small inter-person variation. This feature vector is feed to a multilayer perceptron to carry out the face recognition or identity verification tasks. Proposed system consists in a combination of Gabor and Eigenfaces to obtain the feature vector. Evaluation results show that proposed system provides robustness against changes in illumination, wardrobe, facial expressions, scale, and position inside the captured image, as well as inclination, noise contamination and filtering. Proposed scheme also provides some tolerance to changes on the age of the person under analysis. Evaluation results using the proposedscheme with identification and verification configurations are given and compared with other feature extraction methods to show the desirable features of proposed algorithm.

IV. PROPOSED SYSTEM

In This process we propose a face descriptor, using the algorithm local directional ternary pattern (***LDTP***), for facial expression recognition. Hence LDTP is used to extract the feature information of emotion-related features by using the directional information and ternary pattern in order to take the fine edge in the face region while the face having the smooth regions. This proposed method has better than the other existing, by extracting the histogram-based face description methods that divide the face into a small blocks and then the sample codes uniformly.Then the grid to construct the face descriptor while sampling expression related information at different scales are classified.

Dimension reduction by extracting discriminating features is based on the idea of maximizing the total scatter of the data while minimizing the variance within classes. It can be seen that the feature values for the six classes are highly merged, which can result in a high misclassification rate. Please note that the actual number of features could be more than three, however, for the sake of visualization, the first three features were picked in order to create. Accordingly, this work employs a robust feature. This is easy to explain, has good predictive ability, and computationally, it is less expensive than other existing methods. As mentioned before that the existing HCRF utilizes diagonal covariance Gaussian distributions in the feature function and does not guarantee the convergence of its parameters to some specific values at which the conditional probability is modeled as a mixture of normal density functions. Because of this property, the existing HCRF losses a lot of information. This is one of the main disadvantages of the existing HCRF model. In order to solve this limitation, we explicitly involve full covariance Gaussian distributions in the feature functions at the observation level.

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