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DIFFUSION SPEED MODEL FOR HETEROGENEOUS FACE RECOGNITION USING SVM CLASSIFIER SIMILARITIES

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ABSTRACT

Heterogeneous face recognition (HFR) involves matching two face images from alternate imaging modalities, such as an infrared image to a photograph or a sketch to a photograph. HFR framework is proposed in which both probe and gallery images are represented in terms of nonlinear similarities to a collection of prototype face image. The scope of this project aims that detecting the natural responses of the face, which include eye blinking, mouth movement, and head rotation. Especially the detected eye blinking based on the undirected conditional graphical framework, which is discriminately measures of eye states is incorporated and we suggested the utilizing the optical flow line of the mouth region will be projected velocity vectors onto their intuitive stick-mouth model and extracted the statistics of the lip motion for face liveness detection.

Keywords: *face expression, local directional number pattern, face liveness detection, heterogeneous face recognition, SVM classifier*

1. INTRODUCTION

Heterogeneous face recognition is that circumstances exist in which only a particular modality of a face image is available for querying a large database of mug shots (visible band face images).The accuracy of the HFR system is improved using a random subspace framework in conjunction with linear discriminant analysis (LDA).The proposed heterogeneous prototype framework uses training data to define the prototypes and to learn the linear subspace projection matrix W.1) improving the accuracy of each of the tested HFR scenarios separately, and 2) incorporating additional HFR scenarios. Tailoring the PRS parameters and learning weighted fusion schemes for each HFR scenario separately should offer further accuracy improvements. One additional HFR scenario that should be considered is 3D to 2D face matching. PRS should be particularly impactful in this scenario because heterogeneous features will be required to

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represent faces in the 3D and 2D modalities. AN emerging topic in face recognition is matching between heterogeneous image modalities. Coined heterogeneous face recognition (HFR).The motivation behind heterogeneous face recognition is that circumstances exist in which only a particular modality of a face image is available for querying a large database of mug shots (visible band face images).Face images captured in different spectral bands are said to be heterogeneous. A new approach based on subspace-mapping for heterogeneous face recognition and synthesis. In the recognition section, Local Binary Pattern (LBP) is used as facial representation for near infrared (NIR), visual light (VIS) and 3D range images. Then Canonical Correlation Analysis (CCA) is applied to learn the mapping between the different LBP-face patterns. The corresponding matching scores are calculated in the CCA subspace for the final decision according to the CCA transformation matrices obtained above, we apply ridge regression to determine an approximate linear relationship between the target pattern image and the projection vector of the probe. Although the heterogeneous face images from a same individual are significantly different in appearance, we can still achieve multi-modal patterns matching by image processing and transforming. In the entire process of heterogeneous face recognition, image representation and matching algorithm are two crucial parts[1] robust real time face detection is difficult and complex method for face detection dataset and not time consuming.[2]co-occurrence matrix does not time consuming because results are not uniformly distributed.[3] Where face recognition does not work well include poor lighting, sunglasses, long hair, or other objects partially covering the subject's face, and low resolution images. Another serious disadvantage is that many systems are less effective if facial expressions vary. Even a big smile can render the system less effective.

2. RELATED WORKS

2.1 design of an image based face expression recognition system

The principal approaches (i.e., image-based and model based) to FER using static images are described. Image-based methods extract features from images without relying on extensive knowledge about the object of interest, which are typically fast and simple, whereas model based methods attempt to recover the volumetric geometry of the scene, which are typically slow and complex. The geometric features present the shape and locations of facial components (including mouth, eyes, eyebrows, and nose). The facial components or facial feature points are extracted to

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form a feature vector that represents the face geometry. The appearance features present the appearance (skin texture) changes of the face, such as wrinkles and furrows. The appearance features can be extracted from either the whole face or specific regions in a face image. This paper focuses on the static color images and a holistic technique of the image-based method is used for feature extraction. The image based FER systems consist of several components or modules, including face detection and normalization, feature extraction, feature selection, and classification.

2.2 methods for involved for detection

- viola- jones method
- log- gabor filter method

viola jones method

It obtain experience images, which have normalized intensity, are consistent in style and illustrate only the experience region. The head of an image is recognized using the Viola–Jones technique based on the Hair-like functions and the AdaBoost learning criteria.The Viola and Jackson technique is an item recognition criteria providing competitive item recognition rates in real-time. It was mainly designed for experience recognition. The functions used by Viola and Jackson are based on pixels selected from rectangle-shaped areas enforced over the image, and display high understanding to the vertical and the lines of horizontally type. The purpose of shade normalization is to reduce the lighting effect because the normalization procedure is actually lighting removal procedure.

Log gabor filter method

The Gabor filters is one of the most best image filter performance of others. The Gabor filtration have two significant restrictions, i.e., the highest possible data transfer usage of Gabor filtration is restricted to roughly one octave, and the Gabor filtration are not maximum to accomplish wide spectral details with the highest possible spatial localization.The Gabor filtration are bandpass filtration, which are affected from missing of the low and the high-frequency details. To get the wide spectral details and to get over the data transfer usage restriction of the conventional Gabor

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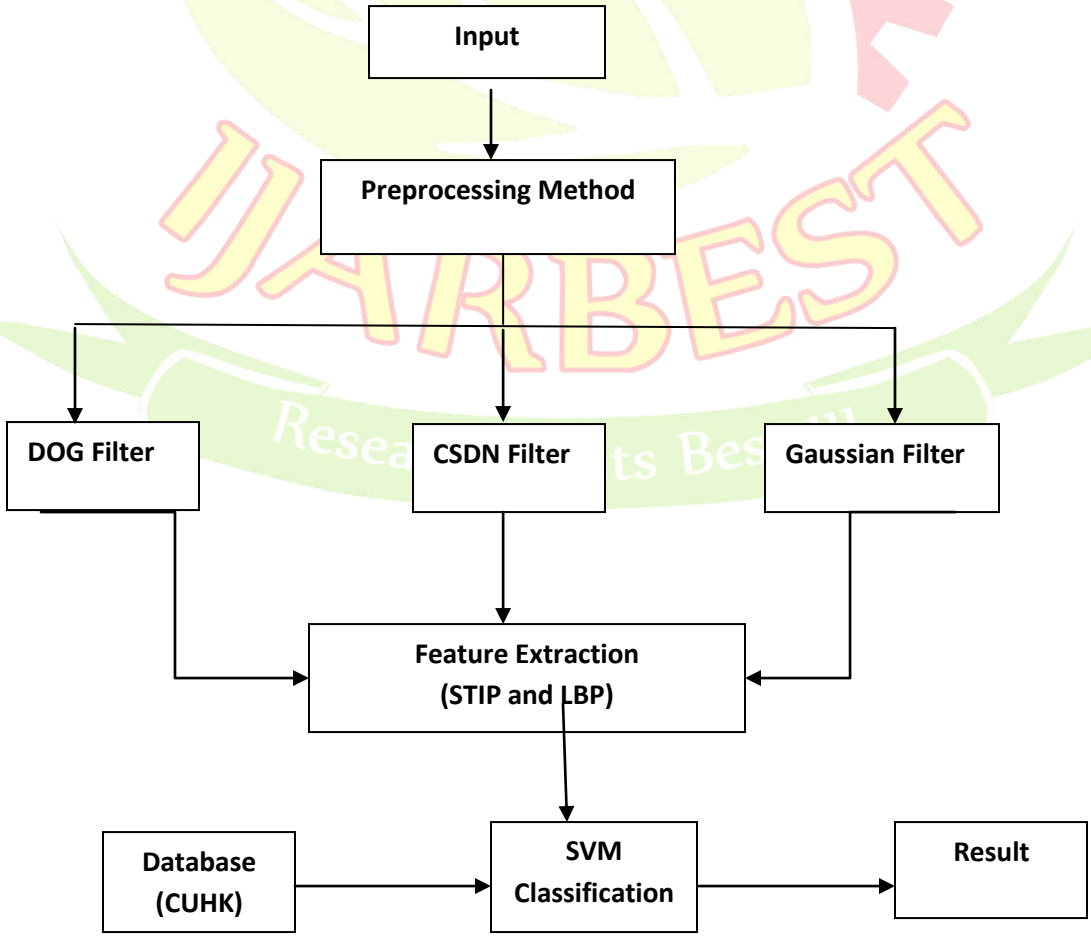
narrow, Area suggested Log-Gabor narrow . The reaction of the Log- Gabor narrow is Gaussian when considered on a logarithmic regularity range instead of a straight line one. This allows more details to be taken in the high-frequency places with suitable great successfully pass functions.

3. PROPOSED WORK

The proposed method presents a new approach to heterogeneous face recognition, and extends existing methods in face recognition. The use of a nonlinear similarity representation is well suited to the HFR problem because a set of training subjects with an image from each modality can be used as the prototypes and, depending on the modality of a new image from each prototype subject can be selected from the corresponding modality.previous feature-based methods, where an image descriptor invariant to changes between the two HFR modalities was needed, the proposed framework only needs descriptors that are effective within each domain.The proposed method is effective even when different feature descriptors are used in the probe and gallery domains.



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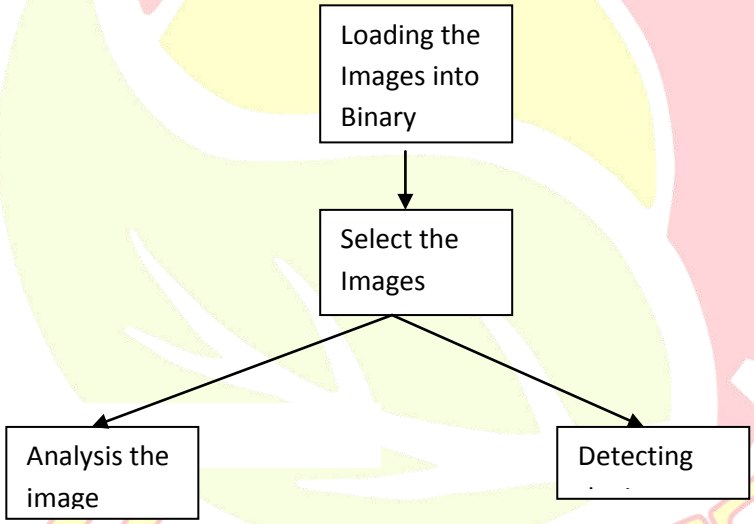
3.1LOCAL DIRECTIONAL NUMBER PATTERN

LDN is a six bit binary code assigned to each pixel of an input image that represents the structure of the texture and its intensity transitions. we create our pattern by computing the edge response of the neighborhoods using a compass mask, and by taking the top directional numbers, that is, the most positive and negative directions of those edge responses.



3.2FACE EXPESSION

Each face is represented by a LDN histogram (LH). The LH contains fine to coarse information of an image, such as edges, spots, corners and other local texture features.

3.3TENSOR BASED COLOR FRAMEORK

The emotion recognition of image texture performs a significant role. Color space gives less identification rate compare to perceptual color spaces (CIE lab and CIE Luv) and these provides effective and efficient efficiency for face appearance using face pictures with lighting variation.

CIE LAP

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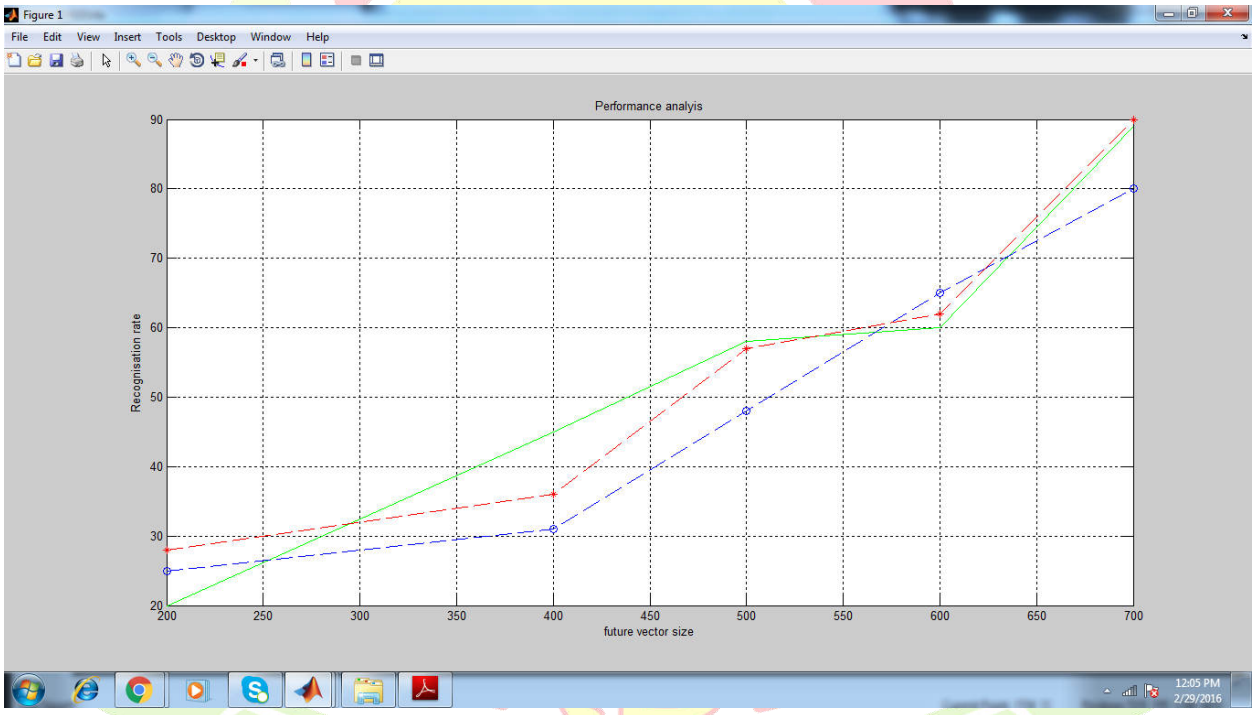
It is widely used in several image processing applications include: perceptual image quality assessment, face detection, skin detection, and image segmentation.

CIE LUV

To improve the brightness and vividness determine the strength or value of identifies the luminance.

4.PERFORMANCEEVALUTION



5.CONCLUSION

The heterogeneous liveliness face recognition (HLFR), which performed the probe and gallery images are initially filtered with three different image filter. Those results were compared against a leading commercial face recognition engine and the gallery size was increased in addition to that outputs were replicate real matching scenarios. In addition to excellent matching accuracies, one key benefit of the proposed method is that different feature descriptors can be

used to represent the probe and gallery images. Finally, the number of prototypes needed by P-RS for effective performance was shown to be stable.

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