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AUTOMATIC FACIAL AGE ESTIMATION

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***Abstract*— Face recognition is the process of identifying one or more people in images or videos by analysing and comparing patterns. Algorithms for face recognition typically extract facial features and compare them to a database to find the best match. Face recognition is an important part of many biometric, security, and surveillance systems, as well as image and video indexing systems. Improvements indiscriminative power come at a computational cost and with a risk of over-fitting. The system proposes a new approach to dense feature extraction for age face recognition.**

Keywords- face recognition, estimation, dense local features,support vector machine(svm).

I. INTRODUCTION

Face recognition is the process of identifying one or more people in images or videos by analysing and comparing patterns. Algorithms for face recognition typically extract facial features and compare them to a database to find the best match. Face recognition is an important part of many biometric, security, and surveillance systems, as well as image and video indexing systems. Face recognition leverages computer vision to extract discriminative information from facial images, and pattern recognition or machine learning techniques to model the appearance of faces and to classify them. We can use computer vision techniques to perform feature extraction to encode the discriminative information required for face recognition as a compact feature vector using techniques and algorithms.

Dense local feature extraction with SURF, BRISK or FREAK descriptors.Histogram of oriented gradients. Distance between detected facial landmarks such as eyes, noses, and lips. Machine learning techniques can applied to the extracted features to perform face recognition or classification using Supervised learning techniques such as support vector machines (SVM) and decision trees, Ensemble learning methods, Deep neural networks.

II LITERATURE SURVEY

1. Title: Review on Common Feature Discriminant Analysis for Matching Infrared Face Images to Optical Face Images (2014)

Author: Shubhangi G. Rode

In the industry the major challenge is to match the infrared face images to the optical face images. The problem arises of the variation between two images (modality gap). This is because of the infrared image captured by inferred imaging device and optical image captured by optical imaging device. To reduce the modality gap between infrared and optical images one method is use. Common feature discriminant analysis this method improves infrared-optical face recognition performance. This method provides extract the common features from heterogeneous face images, (infrared face image and optical face images). Second matching method is applied to resulting features to obtain final decision. An infrared face recognition system can work on all-weather conditions and has no shadow problem. So, infrared face recognition is an active research area during last years. face recognition performance. In this paper, proposed a method to increase the presentation of face detection and recognition systems. First it detects faces after that it recognizes the detected faces. In detection process it used the Gaussian skin color model with skin coior segmentation, which is combined with AdaBoost algorithm. To create a rational trade off, between the time complexity and accuracy and extend a high performance face detection algorithm. It is fast and more accurate. Above algorithms to make an efficient face recognition system with a high recognition rate. For improve the face detection performance, a series of morphological operators used. In the recognition part, first Gabor features extraction is done, then dimension

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reduction by using PCA, after that feature selection by using LDA, at last SVM based classification. PCA selects features useful in class representation, while LDA algorithm selects features the at are efficient for class separability.

III PROPOSED SYSTEM

Problem statement As referred in literature survey PCA(principle component analysis) is used for face feature extraction ,USA classifier were used for classification. This holds good only for known datasets, But accuracy will meet up to 60%. Thus there is chance of wrong ageestimation.Also here they haven't mentioned for real time image capture. So this leads to disadvantage.

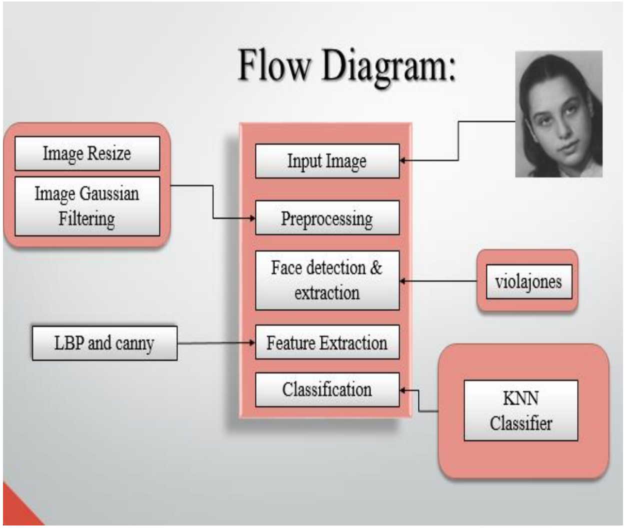
In this paper, the system proposes a new approach to recognize a face. It consists of two steps. First, an encoding scheme is devised that compresses high-dimensional dense features into a compact representation by maximizing the intra user correlation. Second, the system develops an adaptive feature matching algorithm for effective classification. A compression encoding scheme based on maximum correlation criteria is proposed in this system. This scheme effectively converts high-dimensional dense features into a much more compact representation. Furthermore, the system proposes a new face matching method, called the 'Adaptive Matching Framework', and conduct experiments in four different face recognition scenarios: face recognition in the wild, aging face recognition, and matching near-infrared face images and optical face images, and the FERET test.

An effective compression encoding scheme based on maximum correlation criteria is proposed. When combined with dense face descriptors, this scheme is able to produce highly discriminant, yet very compact, descriptors. This is supported by thorough experimentation. Based on this feature descriptor, a novel feature matching method, termed the Adaptive Matching Framework, is proposed and which further improves performance. Experiments are conducted to demonstrate that the proposed approach obtains a state-of-the-art result in challenging settings. The system also demonstrated that the proposed approach is generalizable to other large-scale face databases.

Face recognition is a complicated task that requires efficient handling of complex variations in facial appearance caused by a range of factors, such as changes in lighting conditions, expression, and aging effects. It is difficult to address all variations using a single descriptor and, therefore, combining multiple features is common in practice.

Our compression encoding scheme has advantages over existing schemes in terms of efficiency and efficacy. First, the feature dimension is significantly reduced, and the computational cost is largely saved accordingly.

The memory cost is exactly proportional to the length of features, which implies 12 times less memory cost for SIFT and 6-timesless memory cost for LBP. For time complexity, since we are compressing the features at local features level, instead of global features level This method can improve the computation efficiency significantly, given that running global dimension reduction. the discriminative information is properly explored for improving the performance. Of note, the discriminant information often lies in mutual information in multiple face images, modeled by the intra-user correlation, and therefore enhancing the intra-user correlation improves discriminant power.



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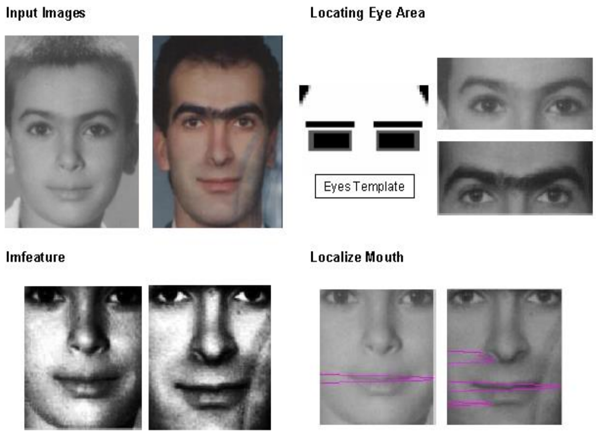
IV IMPLEMENTATION

Preprocessing:

Prior to feature representation, the face images were pre-processed. The parameters used for the Adaptive Matching Framework are shown. K denotes the size of the training subsets (K Nearest Neighbors) described. And 'active sub-classifiers' denotes the percentage of sub-classifiers selected to compute the matching scores described.

Note that the parameters K and b were determined by experimental validation using 30% of the training data. Specifically, we increased the K value gradually and for each K value, we determined an optimal b value that achieved the highest verification accuracy on the validation data. The optimal K and b values were thus determined in such a way that the optimal verification accuracy can be achieved. In this study, K is set to be 600 and b is set to be 2.865.



Feature extraction:

High-dimensional facial feature scan be extracted using both dense sampling landmarks and multi-scale techniques. High-dimensional facial features contain much more information than low-dimensional ones, which is important for boosting recognition performance, but this benefit comes at the expense of computational complexity. For example, projecting100K-dimensional facial features to 1K-dimensions requires100M floating point multiplications, even if using a linear projection such as Principle Component Analysis (PCA).We therefore propose an effective compression encoding method that turns dense features into a compact feature representation, while at the same time enhancing the discriminative power.

Feature encoding:

V. CONCLUSION

We present a two-level hierarchical learning model for aging face recognition. At the first level, effective features are extracted by adaptively selecting the local patterns that optimize the common information. At the second level, the output from the first level are further refined using our scalable high-level feature refinement framework to form a final powerful face representation. Extensive comparison experiments based on the MORPH Album 2 dataset reveals a significant improvement over the state-of-the-art.

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