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A Framework for Facial Image Mining by Search-Based Face Annotation

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Abstract— Face annotation is very famous in social media as well as in documentation, security area. It is method of searching similar faces in huge database but another side not simple as. In today's era it is one of the challenging phase in image processing. This paper implements Search-based face annotation (SBFA) and Text-based face annotation (TBFA), SBFA is the technique which detects similar face from set of facial images and TBFA is method to search facial image by name. Also in research area, we propose an indexing and training technique for facial images to make efficient framework for face annotation. Further we perform experiments on huge-scale facial image dataset and it outputs encouraging results which shows that indexing and training techniques boosts SBFA method for face annotation.

Keywords— Face annotation, social media, security area, SBFA, TBFA,

I. INTRODUCTION

We know that social media and news media are having huge amount of facial images, some of these tag with proper way but most of not. Social and news media having large amount of facial image. So here is concept got, new evolution and that is face annotation. The concept face annotation is nothing but annotate facial images from large dataset [1],[4].

Face annotation is very useful in our real file. Now a day's many social sites such as facebook, twitter, google pluse and android applications are using facial images. The requirement of facial images not end here, for security purpose, making personal album, national records of people (personal information) for record, beside this we can also used in news media or video for detecting a require person face, so on this way we can use face annotation and many more useful other applications[1],[2],[3],[7],[10].

In research work of auto face annotation there is many work has perform and to achieve satisfactory result in face annotation the process must need some training face like supervised learning techniques[10],[11],[12]. There is graph based approach, in which they used Scale-invariant feature transform (SIFT) and match two faces on concentrating some points on faces which is same in two facial images. Such as one image having smile in face and same another image having smile, then this is one consideration they had taken and some another points like eye brow, nose, nose paddle, eyes, hair style[5]. While in transductive kernel fisher discriminant (TKFD) method has also a good one, because they invent a scheme which can annotate labeled and un-labeled facial images [9].

In practical face annotation is not simple process, because if we consider a single person and collect some facial images of him, we will find much variation in facial expression at different time images has taken. In order to recognize any facial image of person we must have a training data [11][12], so that by training data we can extract features of image and then match with query image of particular person. In this paper we implement a training set and this will yield require output.

In auto face annotation research history says that there are many methods for recognizing face from image for query person. Still we have some common problems which observe in most research, when we take query facial image it may having labeled or unlabeled, image may having low resolution, pose of that person, illumination, occlusion , age difference problems in it. These are most observed areas and most challenging area for auto face annotation research. The more about face reorganization and its methods are given in [1],[5],[6],[8],[9],[10],[13].

Now, in this paper we are implementing SBFA [1] frame-work and new training technique for face annotation. The training technique is increase probability of recognizing right person in huge facial image dataset, for image dataset we have taken freely available facial images from World Wide Web (WWW) and from users. Here users are those people which provide us their facial images on web for project. SBFA framework mainly designs to overcome problems and results of content-base image retrieval (CBIR) method [3]. The main aim is to implement new face annotation technique by using SBFA which yields require results for facial images. We firstly provide a query image and features of that image retrieve now these features are going to match with all facial images which are present on web (specific location). If the feature of query image match with image located on web then that image is collect in list and last we can see all match images.

This paper is organized as following: section 2 consist a related work, section 3 consist a project framework and information, section 4 consist a experimental results and finally 5 is conclusion and future work.

II. RELATED WORK

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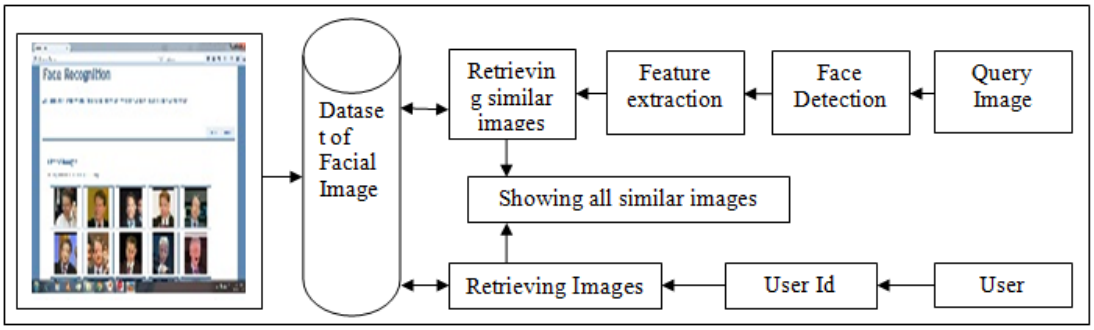
As several studies has been perform on auto face annotation still researchers trying to eliminate the common and challenging tasks from face annotation. In this research area there is graph based approached used for naming faces in images, to recognize similar images in huge dataset they used SIFT descriptor. By using SIFT, while matching two facial



images. There is process of matching some points on faces. If the points of one image is matched with another by geometrical and unique match then both images are similar. By finding average distance between both images they construct similarity graph. Then most similar images collected by using greedy component algorithm [5].

Further in research area there was a method of content-based image retrieval (CBIR), which was introduced in 1980s to overcome the limitations of text-based retrieval system. CBIR mainly focus on digital images in huge database and work on basis of part of image or image. Where image or part of images means it will concentrate of shape, color, texture, and layout for indexing. The feature of image extracted (visual contents) and it will show in form of multidimensional feature vector. When query image is provided it will find the features of that image and match with database [3]. But limitations of this method are, it is extracting feature by concentrating on shape, color and texture. This is not sufficient enough to get proper result.

In the metric learning approach, a new invention of a logistic discriminant approach which learns metric from colle-ction of all labeled images pairs and nearest neighbor approach for finding probability of different facial images are having same attribute or not. Logistic discriminant based metric learning (LDML) method based on the concept of distance between the two images in positive pairs and negative pair [10]. If distance between positive pair is less than negative pair then the probability of having same image greater and results are store. For distance calculation they used mahalanobis method.

while in study, face recognition for low resolution images. A local Zernike moment method (LZM) develops. Dealing with face recognition. There may have facial images with low resolution and this method has overcome with this limitation. It is based on complex moment coefficients and character recognition of images. For extracting features of images they divided image into sub blogs (region) , so that better result can achieve. Moment component divided into non- overlapping sub region that is N × N sub region and half blog shifted (N - 1) × (N - 1) sub region which have same size as previous one. Further used SIFT for blur facial images, extracting features of facial images they used OpenCv library so that performance can be increase [6].

In FANS (Face ANnotation by Searching large-scale web images), where user will provide a facial image and then mini-ng process start for that query image. It will results a top match facial images. This focus on search-based face annotation system and shortlisted top k-similar images from web image database. About FANS framework, it based on four parts. In first part is for collection of facial images from World Wide Web. In second part perform indexing module for database im-ages and retrieving features of facial images. Third part implement content-based facial image retrieval module for searching images from database and finally mining top k-similar images from database [4].

III. FRAMEWORK FOR FACIAL IMAGE MINING

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this framework, following steps are there

1) Facial image dataset collection from web (freely available).
2) Face detection and extracting possible facial feature from dataset (image).
3) Facial feature indexing and labeling to images.
4) Face annotation and similar face retrieval from dataset.
5) Facial image mining by name.

These are the framework steps. In which first step is to collect facial image dataset from World Wide Web, for that we made a one web site and in this site any one can upload his/her some images and also download. Now we have dynamic dataset of facial images. Through web site we can download and train facial images and when user will provide his/her facial image, the query image match with dataset image and whatever query image feature match with dataset image that particular image will be displayed. So there may be one or as many as. It is also depend on user query image as well as number of images provided by user while uploading.

In second and third module, face detection, training of facial images and labeling to all images. Those facial images uploaded by user is in dataset, that images provide for face detection, it did with help of OpenCv, in training mode we select image and provide to face detection. If face get detected then it is converted into gray scale image and then we will provide name and one id. Id is auto generated and for purpose, if there is two users with same name then we cannot differ between them. So by using name with unique id we can identify correctly. Here we solve the global issue of name.

In forth module deals with recognizing similar facial images

when query is given. Query image converted into gray scale image and gray scale image match with another images. So we is eigenvector algorithm for recognizing face. While searching in dataset the query image feature and dataset image feature get match. If feature of query image match with dataset images, then that image will be in list and will display.

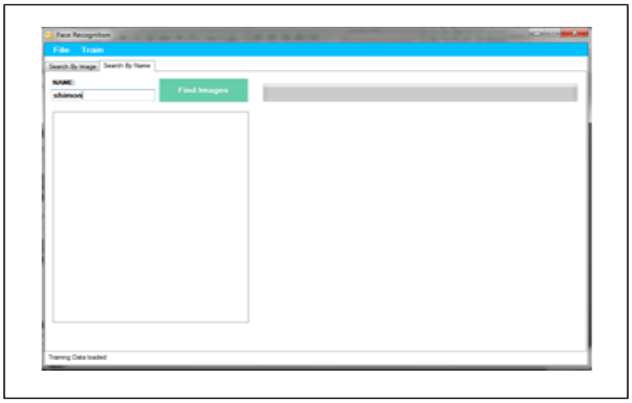
In the fifth module we have to provide name with unique id provided at the time of training face. When user will provide unique id and name. The result will display.

IV. EXPERIMENTS

We did experiments on large dataset as well as various factors of images such as illumination, age difference, facial expression, photo click event, occlusion and position of person (side face). Our project showing well results for all the factors and time factor is also less.

1) Web site: Collection of facial images, user will going to upload facial images on this site.

2) Project main page: here is menu option for exit and train image, Buttons: a)Select image b) Search image.



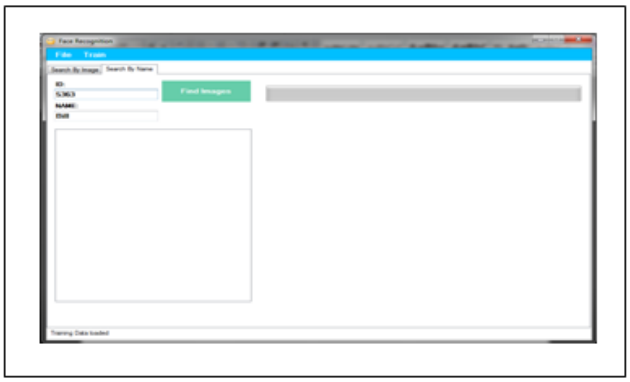
Training Image:

In training mode we are going to provide a query image and then converted into gray scale image. this process we did for all images of that particular person.

3) Select image which is query image:

4) After search we got similar images. Most of images are similar to query images but some may be of another person.

5) Search with name:
It is also a Text-Base Face Annotation, in which we provide a name of person



V. CONCLUSIONS AND FUTURE WORK

We gone through many researches relate to face recognition area and develop new framework for facial image mining. This framework is good enough to detect and recognize similar facial images. In this project we use search-base face annotation method with text-base face annotation. So that user can view his/her images by providing facial image as well as name also. So that this framework is efficient and also gone through various factors facial images.

In future work for this project is to enhancing in more factors of images that affects results of face recognition. Also search by name method, find probability to search facial image by name

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