

## **FACE ANNOTATION USING WEB IMAGES FOR ONLINE SOCIAL NETWORKS**

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**Abstract** – Face annotation means recognize human faces from a photo, face annotation related to face detection, verification and recognition. Nowadays a large number of photographs, medical images, satellite images and digital images are engendering daily basis. The rapid growth of online photo albums and social networking sites, a tremendously large amount of photos have been uploaded by the user and stored on the internet. Some of these images are tagged but many of them are not tagged properly, so the auto face annotation are came. Auto face annotation is important technique to assign the human faces with their corresponding human names without any human manual efforts using machine learning techniques. This paper mainly focuses on automatically identify human faces with names in social networking sites and online photo album management.

**Keywords** - Face annotation, web facial images, weakly labeled data, label refinement, search based face annotation, content based image retrieval, machine learning.

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### **I. INTRODUCTION**

Auto face annotation is playing important role in many real world applications, it is mainly focuses on automatic image recognition on social networking sites and online photo album management, example Auto tag suggestion in Facebook, Flickr, Picasa, Smug mug and so on, which annotates the photos uploaded by the users for managing online photo album. The goal of the paper is to collect the images from the internet and finding the images which are weakly labeled among the collected images to make them as strong labeled images then stored on the local database for recognition/identifying. Face annotation is used for two primary tasks are followed as

Verification – One to one matching

Identification – One to many matching

In earlier works classical face annotation research for face recognition and verification has some problem where different classification model are trained from well labeled facial image environment., then model based face annotation has also some problem that is more time consuming and very expensive to collect a large amount of human highly labeled training images and it is difficult when new number of persons are added in which retraining process is required and the performance annotation become poor in large scale.

Recently a search based face annotation are used for facial image annotation by mining the World Wide Web, where large number of weakly labeled facial images are freely available. This aims to tackle the auto face annotation task by content based image retrieval. The main objectives of search based face annotation is to assign correct name labels to a given query facial image.

### **II. RELATED WORK**

Several studies are about face annotation on social photos, personal and family photos.

## **2.1 Collaborative face recognition technique**

Jae young choi, Wesley de neve et al. [3] presents collaborative face recognition method that aims to improve face recognition accuracy. The creation and management of multimedia content, photos from social networks consists of

- Socialization – user to share multimedia content and uploaded photos can be automatically relayed to the other users who are tagged on the photos.
- Personalization – multimedia content posted on social network mainly individual user generated images and videos.
- Decentralization – online social network allows independent repositories to individual users for storing the multimedia contents.

The proposed method makes use of multiple FR [3] engines and databases over social networking sites achieved better performances than independent FR.

## **2.2. Cluster annotation and Re-ranking for easy album**

J. Cui, F.wen et al. [7] developed several innovative interaction techniques for semi automatic photo annotation.

Cluster annotation puts similar faces or photos with similar scene together and enable user label in one annotation, annotation UI which annotates by cluster instead of one by one so it reduces user lumber.

Contextual re-ranking improve the labeling productivity by guessing the user intention allows user label photos while they are browsing and improves system performance through learning propagation.

Digital photo albums are growing explosively in both number and size due to the rapid growth of digital cameras and mobile phones in last decayed. Automatic management of these large photo albums becomes indispensable [7]. The later approach batch annotation or bulk annotation is adopted widely in much commercial photo album management like Picasa. These photo annotation user interfaces reduces the difficulty compared to annotate the images one by one, but users still manually select photos to put them in a batch before batch annotation, when users want to correct some incorrectly labeled faces in a group, they can use single face annotation through drag and drop, UI also supports drag and drop operation.

Automatic face recognition techniques have also been developed with increasing efficient and performance. It is used for similar face ranking and poorly perform in family photos ranking all faces is very low.

## **2.3 Partial clustering and interactive labeling**

Face annotation is important for a photo management system. Y Tion, Wei Liu et al.[13] proposed a interactive face annotation framework by combining unsupervised and interactive learning.

In unsupervised, a partial clustering is proposed to find the most evident cluster instead of grouping all instances into group clusters which is an initial labeling for later user interaction. In interactive stage, an efficient labeling procedure is proposed to reduce user interaction as much as possible.

Girgensohn et al. [13] used face recognition to sort faces by their similarity to a chosen faces or trained face model with reducing user efforts.

Davis et al. also used to contextual metadata to help face recognition in social context information and body to do automatic annotation.

Leiet al.[13]proposed a semi – automatic approach to face annotation it is used in commercial systems like iview, media pro and so on.

## **2.4 Contextual identify recognition**

Dragomir anguelov et al. [18] presents an efficient probabilistic method for identify in personal photo albums done by constructing a Markov random field combines all contextual cues in recognition frame work. This has been demonstrated in popular software by the company Riya, which uses face recognition to annotate images with the names of people.

## 2.5 Purify web facial images

This mainly focuses on purifying the noisy web facial images which is collected from internet for face annotation application. These works are proposed as a simple preprocessing state in the whole process without adopting sophisticated face techniques T.L.Berg et al. [1] applied a k – means clustering approach for cleaning of the noisy web facial images. Zhao et al. [20] proposed a consistency learning method to train face models for the famous personalities by mining the text - image on the web as a weak of relevance toward supervised face learning task from a large and noisy training set [20]. By using the unsupervised machine learning techniques and propose a graph based label refinement algorithm to optimize the label quality over the retrieval database in the SBFA task.

## 2.6 Search based face annotation

Dayong wang, steven C.H. Hoi et al.[4] propose an effective unsupervised label refinement by using machine learning techniques to improve the label quality from the weakly labeled data without any human manual efforts through graph-based [10] and low rank, convex optimization algorithm to solve the large scale task efficiently, they also propose a clustering based approximation algorithm to improve the scalability and performance of search based face annotation task. This aims to tackle the auto face annotation task by content based image retrieval [4]. The main objectives of search based face annotation is to assign correct name labels to a given query facial image.

A novel facial image for recognition, first retrieve a short list of top k similar images from a weakly labeled facial image database and then annotate the facial image by voting method to retrieve the most similar image.

## III. SYSTEM ARCHITECTURE

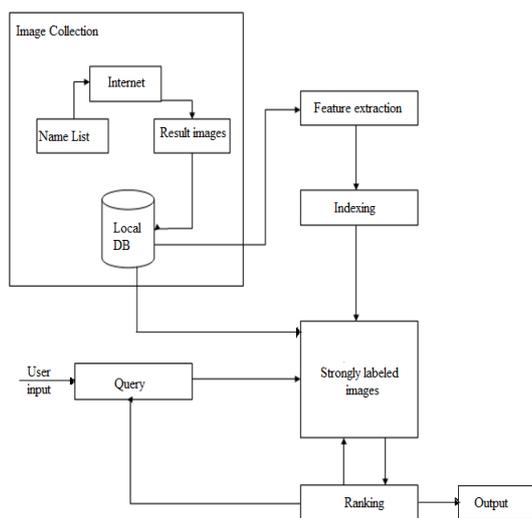


Figure 1. System architecture

## IV. PROPOSED SYSTEM

The search based face annotation which is easily interact with social networks consists of following steps

- Facial image data collection

- Face detection and facial feature extraction
- High-dimensional facial feature indexing
- Learning to refine weakly labeled data
- Similar face retrieval
- Face annotation by majority voting on the similar faces with the refined labels.

#### **4.1 Facial image data collection**

The first step is the data collection of facial images from the WWW by using an existing web search engine (i.e., Google). According to a name list that contains the names and image of persons to be collected. The collected images will be stored in local database. The nature of web images, these facial images are often noisy, which do not always correspond to the right human name. Thus, we call such kind of web facial images with noisy names as weakly labeled facial image data. By using ULR to improve the quality of weakly labeled images.

#### **4.2 Face detection and facial feature extraction**

To preprocess the web facial image extract face-related information, including face detection and alignment, facial region extraction, and facial feature representation. For face detection and alignment adopted the unsupervised face alignment technique. GIST texture feature for facial feature representation. The proposed ULR method to refine the raw weak labels together with the proposed clustering-based approximation algorithms for improving the scalability.

#### **4.3 High-dimensional facial feature indexing**

To index the extracted features of the faces by applying some efficient high-dimensional indexing technique. To facilitate the task of similar face retrieval the locality sensitive hashing (LSH), a very popular and effective high-dimensional indexing technique is used.

#### **4.4 Learning to refine weakly labeled data**

Label will play a key role. To improve the quality of label by using ULR.

#### **4.5 Similar face retrieval**

From this modules are test phase; given an input query facial image for annotation. The set of top K similar images are retrieved from the indexed database.

#### **4.6 Face annotation**

Face annotation by majority voting on the similar faces with the refined labels. To annotate the facial image with label by ranking that combines the set of labels associated with the similar facial image. Proposed algorithm to further improve scalability and propose another approach based on the coordinate descent algorithm, which enables to exploit parallel computation for very large-scale problems. The QP is much smaller than the original one and can also be solved by the previous multi-step gradient algorithm.

## **V. APPLICATIONS**

Face Annotation finds its applications in the field of:

- Online photo album management and also in video domain.
- Security purpose (access control to buildings, airports and ATM machines).
- Forensic.
- Face annotation in macro scale and micro scale.

## VI. CONCLUSION

This paper presents an ample survey on face annotation techniques for web facial images. Currently, many new approaches are proposed in the field of auto face annotation. The problems of weakly labeled facial images are improved by using a proposed unsupervised label refinement algorithm and clustering based approximation scheme for improves the scalability. The proposed techniques achieved promising results under a variety of settings. This technique will helpful in social networking sites and online photo album management.

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