A Survey on Face Annotation for Content Filtering based on Different Techniques

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Abstract: With the rapid advances in the field of multimedia technologies the collection of numerous digital images are also on verge of increase. This has led to the research in the field of image annotation. Auto face annotation is playing an important role in many real-world applications. Face annotation task is part of face detection and recognition. Various pictures are uploaded on social sites daily but many of them are tagged with false name or improperly. It then becomes problematic in recognizing a person properly. Automatic image annotation is the process of automatically assigning semantic labels to images. This paper presents the survey on different approaches for auto face annotation and image based annotation retrieval and also it aims to cover the latent space and generative approaches for auto face annotation and includes a proposed methodology in short.

Keywords: Face Annotation, Search based face annotation clustering based approximation, unsupervised label refinement.

I. INTRODUCTION

The widespread use of digital media devices are increasing so the different social media tools used for sharing photos. The large number of human facial images are shared over the different social real world application. Some of this images are tagged properly but many of the image are not tagged properly then it becomes problematic in understanding the name of person if any random person sees it so the facial annotation are came. The main aim of image annotation process is to automatically assign associate label to images, so image retrieving users are able to query images by labels and automatically detect human faces from a photo image and further name the faces with the corresponding human names.

Auto face annotation is used for automatic face image annotation without any human intervention [1,3,4,6]. Facial annotation is also applying for videos, such as annotation of facial images from news video is done and then it showed on television so that peoples can recognize person in TV [2,5].

Auto face annotation can be useful in real world applications like online photo sharing sites able to annotate the face from user uploaded photos to make easier online photo search & management. A large collection of photos usually make a great challenge for the end user to detect facial image from photo,browse and search. One possible solution for this problem is that tag images manually but it is time consuming and more costly. So instead of using the manual face annotation automatically annotation is very reliable. To address the challenges "Auto face annotation" is important technique which automatically gives name to relevant person images [1,8]. This technique is more beneficial to different real world application of search based face annotation. The main objective of search-based face annotation is to assign correct name labels to a given query facial image.

II. LITERATURE SURVEY

Different studies are perform on face annotation in mining weakly labeled facial images which are present over Internet in this human name are treated as input query and aim is to refine the text-based search results by achieving facial images. Many researchers are trying to propose system,which will accept image-based input and generate text-based output. Various research groups are working for successfully fulfilling this objective.

A. Graph Based Approach

Ozkan and Duygulu [7] proposed a graph based model for finding the densest sub-graph as the most related result. Proposed a method to associate names and faces for querying people in large news photo collection. In most cases the number of same faces of queried person will be large so the faces are more similar to each other. They proposed the graph based method to find the similar subset with possible set of faces with query person name. Similarity are represent by SIFT describers. Then apply a greedy graph algorithm. Guillaumin et al.[6] introduced a modification to incorporate the constraint that a face is only depicted once in an image. There are two scenarios of naming persons in database for finding face of person and assigning name to all faces

The text based result is not greatly improved. To improve a recent graph based approach introduce the constraints when optimizing the objective function, generative models have previously been proposed to solve the multi-person naming task by comparing generative and graph based methods the most significant method is graph based method in future extends the graph based method to multi-person naming Guillaumin et al. [6] proposed to iteratively update the assignment based on a minimum cost matching algorithm. In their follow-up work Guillaumin et al. [8], they further improve the annotation performance by using

distance metric learning techniques to gain more distinguish feature in low- dimension space.

B. Unsupervised Label Refinement

Finding the weakly labeled facial images from the World Wide Web and enhance the efficiency and scalability of the images. Use a unsupervised label refinement (ULR) approach for refining the labels of web facial images. We formulate the learning problem as to develop effective optimization algorithms to solve the large-scale learning task efficiently. to further speed up the proposed scheme, we also propose a clustering-based approximation algorithm which can improve the scalability and efficiency[9].

C. Clustering-Based Approximation

The number of variables in the previous problem is n * m, where n is the number of facial images in the retrieval database and m is the number of distinct names (classes).

In particular, the clustering strategy could be applied in two different levels:

1. One is on "image-level," which can be used to directly separate all the n facial images into a set of clusters.

2. The other is on "name-level," which can be used to First separate the m names into a set of clusters,then to further split the retrieval database into different subsets according to the name-label clusters.

D. Search Based Face Annotation

Dayong Wang, Steven C.H. Hoi et al. [9] Propose an effective unsupervised label refinement for refining the web facial images. For improving the performance they also propose optimization algorithm to solve large-scale learning effectively i.e. clustering based approximation the propose system improve the performance of search based face annotation scheme. The work are different form all previous work by two things. To solve general content based face annotation problem using search based where face image as query image. They unsupervised label refinement algorithm which enhanced new label matrix. This work also related recent work of the WlRLCC method [10].The unified learning scheme [11].Adopted locality sensitive hashing [12]. Adopted unsupervised face alignment technique [13].extract the GIST features [14].

E. Content Based Image Retrieval

Active learning has been shown as a key technique for improving content-based image retrieval (CBIR) performance. Among various methods, support vector machine (SVM) active learning is popular for its application to relevance feedback in CBIR. However, the regular SVM active learning has two main drawbacks when used for relevance feedback. First, SVM often suffers from learning with a small number of labeled examples, which is the case in relevance feedback. Second, SVM active learning usually does not take into account the redundancy among examples, and therefore could select multiple examples in relevance feedback that are similar (or even identical) to each other[15].

F. Image Annotation

J. Tang et al. [4] proposed a novel kNN-sparse graph based semi-supervised learning method with regularization on number of training labels, which is used to annotate various noisily-tagged web images by label propagation. Here the graph is constructed to handle the semantically different links. It is generate by reconstructing each and every sample from its k nearest neighbours to improve the efficiency, and in the same study the approximate method is applied to accelerate the kNN search. And the regularization is proposed to handle the noise in the training labels. Experimental results of this study showed a key factor, which affects the performance of image annotation process with the tags as trained labels. Actually, in image annotation scheme, there is no need to correct all the noisy tags; they collected the correct image label pairs as much as possible for training. They also decided to focus on how to construct an effective training set from the community- contributed images and tags in future work.

G. Pose Adaptive Matching Method

Pose adaptive matching method that uses pose-specific classifiers to deal with different pose combinations (e.g., frontal v.s. frontal, frontal v.s. left) of the matching face pair. It is comparable with the state-of-the-art methods on the labeled face in wild (LFW) benchmark, while maintaining excellent compactness, simplicity, and generalization ability, across different datasets. But in this work, the face micro-pattern encoding is learned but pattern sampling is still manually designed. Automating this step with learning techniques may produce a more powerful descriptor for face recognition[3].

III. PROPOSED METHODOLOGY

Flow Diagram:
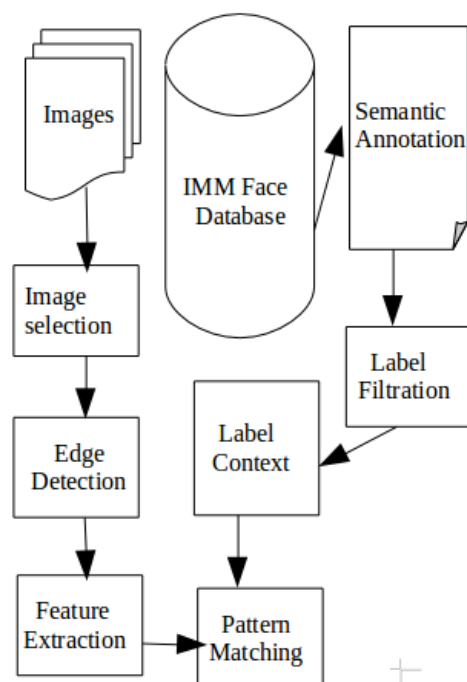
In short ,the proposed method will be based on the following procedure and is as stated:

1. The system is fed with an image.
2. Extracting facial Features
3. The important data is extracted from the sample using software where many algorithms are available. The outcome which is a reduced set of data that represents the important features of the enrolled user's face.
4. Comparison with the new Templates
5. This depends on the application at hand. For the identification purposes, there will be a comparison between the data stored on the database.
6. Declaring a Match with the data
7. The face recognition system will return a match. The intervention of a human operator will be required in order to select the best fit from the candidate data.

IV. APPLICATIONS

- It can be used in social networks for auto tagging.
- It can be used in forensics
- Online photo album management and news video summarization.
- Face annotation at macro scale and micro scale.
- Reduce weak labels and thus have application in efficient online search
- Wild landmark face annotation
- When user interaction is included, reduce it to an acceptable level.

V. CONCLUSION

This paper investigates varied techniques that are used for auto face annotation on weakly labeled images. Many research work and new methods are being proposed in this field. The research in this area demands importance as it is very useful in online searching and social Medias. The overall study of this paper suggests that use of unsupervised labeled refinement (ULR) approach with clustering based approximation algorithm improves efficiency and scalability of search based scheme. The main use of annotation is user can search easily, interact with friends and famous persons. If the techniques are implemented properly, then the data label problem will be solved. In this paper, we attempted to provide a comprehensive survey on search based web facial image annotation. As a survey paper, we might not include each and every aspect of individual works; however we have focused on the wide variety of approaches used for face annotation research work.

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