

Secured Photo Uploading on Online Social Networks

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ABSTRACT: Online Social Networks (ONS) is an important part of our everyday life...At present people are very interested to share the photo on online social networks, unluckily which is used for the purpose we not at all imagine. To check possible confidentiality outflow of a group photograph, we prepared a mechanism in which each person can take part in the decision making on the photograph posting, so everyone in the photograph must be recognized. It is important to have a professional facial recognition (FR) system that can distinguish each person in the photograph. Haar cascade classifier and CBIR (content based image retrieval) algorithm are used in the proposed system for face detection and recognition. Once the faces are recognized from the group photograph then acceptance or reject notifications are sending automatically to each identified people within the close friend circle. The photograph will be posted if all the individuals within the friend circle are accepting the notification and it will not be posted if any of them rejects the notification. We expect that this proposed system would be very useful in protecting users' confidentiality in photo/image sharing over online social networks.

KEYWORDS: Online Social Network, CBIR, K-Mean Clustering, Face Recognition.

I. INTRODUCTION

OSNS have become integral element of our everyday life and has deeply changed the way we work together with each other, data sharing, appreciation and value. photograph sharing is an beautiful feature which increases the value of Online Social Networks (OSNs).Users are allowed to post, comment, and tag a photograph without restraint, so it may disclose users' privacy. In this project, we attempt to find a solution for this issue and study the scenario when a user shares a photograph which containing persons other than himself/herself (termed co-photo for short). At present people is very careless forgetting that once we post a photo in online, it becomes an undying record, and there are chances to use this for purposes we never expect. To prevent possible confidentiality outflow of a photograph, our designed mechanism allow each personality in a photograph be aware of the uploading photograph activity and take part in the decision making on the photograph posting. [1], [10], [11].

II. RELATED WORK

Photograph sharing is doubtlessly the most popular feature in online social networks. Unfortunately, casual photograph posting may reveal privacy of persons in a posted photograph...In this section first papers discuss various security issues and the available prevention methods related to group photo uploading, the second one discuss about the Haar cascade classifier is used for face detection and the third one explain CBIR algorithms used for the face recognition system.

Tagging photograph is one of the popular feature of many social network sites that allows people to annotate uploaded photograph with those who are in them, and linking the photograph to each person's profile. Actually this is a serious privacy leakage issue. To solve this now Facebook added the new security option to avoid this confidentiality leakage issue related Tagging photograph, people can set "review the tag before appear the time line option .this a good method

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to prevent this privacy leakage issue, still this security option can prevent the co- photo owners privacy in a very limited level[2].

Haar cascade classifier is a well used classifier for face detection. It is trained with a lot of face images and non face images. Initially more than 160000+ features values are used within a detector at 24x24 base resolutions which need to be calculated. For this Haar features shown in the Fig.1 is used. Each feature is a single value which is calculated by subtracting the sum of pixels in white rectangle from the sum of pixels in black rectangle. To reduce the computation cost used the concept integral image. Most of the features among 160000+ features are not relevant so used Adaboost algorithm to find out the relevant features. To do this every features apply to training image and elected the features with minimum error rate. After these are found a weighted combination of all features are used in evaluating and deciding the given window has a face or not. Each feature is called a weak classifying Adaboost construct a strong classifier as a linear combination of these weak classifier

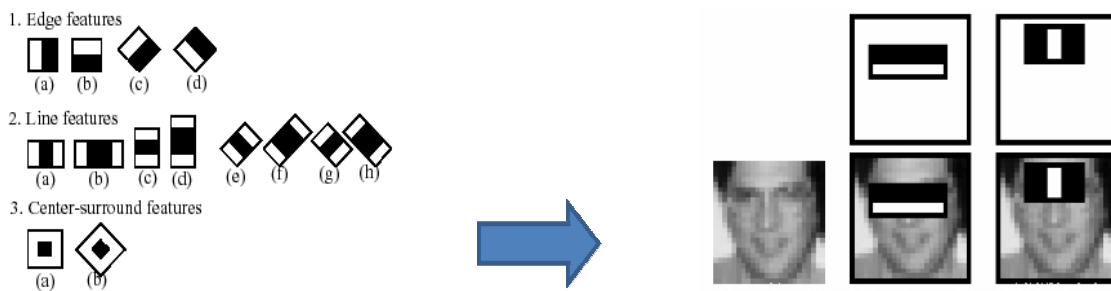


Fig. 1. Haar features for face detection

Cascade classifier composed of different stages and each stage has certain no of features. Each stage is used to determine a given sub windows face or not. The sub window is immediately discarded if it is not a face. Face detection using Haar cascade classifier is very fast, it has an efficient feature selection still there will be error or miss classification. 100% accuracy cannot be ensured [7].

CBIR , Content Based Image Retrieval has been a significant area of research in the last few decades. A retrieval mechanism using color and texture is being proposed here. Depending on the characteristic of the image texture, it can be represented by multi wavelet transform. Through the combination of Multi wavelet decomposition and color correlogram it is possible to increase the number of features and can improves the retrieval accuracy. To support the efficient and fast retrieval of similar images from image databases, feature extraction plays an important role. The technique used for comparing images plays the fundamental ingredient of content based image retrieval. The main advantage of wavelet decomposition is that it yields a large number of sub bands. A major disadvantage of this technique is its limitation in feature set. The problem of retrieving desired image from huge database is a major problem. [3], [5].

Existing system explain the image retrieval using CBIR with Haar wavelength transformation. System Architecture of CBIR system is shown in Fig.2. It has mainly two phases, indexing and searching. Indexing includes decomposition, feature extraction and clustering and another one is searching for a query image. It is an image retrieval technique using Modified Haar Wavelet Transform and K Means Clustering. First process is image training including decomposition, feature extraction and clustering. In the searching phase the most similar images to the query image [12], from the cluster files can be retrieved using CBIR image retrieval algorithm[8].

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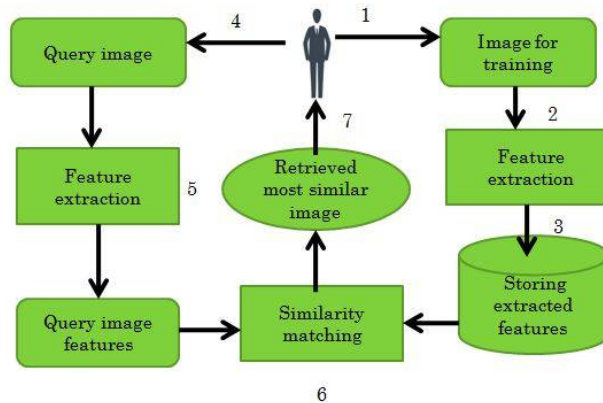


Fig.2 Architecture of existing system (CBIR based image retrieval)

A Haar Wavelet transform decomposes an image into two components: average and difference. Each colour in the image can be represented by considering the pixels as a point in space and from these matrices for each Red; Green and Blue components of RGB are constructed. This is then decomposed into four sub-matrices through row and column transformations.

$$\text{Average} = (fn + fn+1)/\sqrt{2}, \text{ where } n=1,2,3,\dots,n/2$$

And difference at the same level is given by

$$\text{Difference} = (fn - fn+1)/\sqrt{2}, \text{ where } n=1, 2, 3,\dots,n/2$$

Fill the first half of the array with averages and second half of the array with differences, this steps are repeated for both row and column. Once the process is completed, the matrix gets decomposed into four sub-matrices each of dimension (number of rows/2) x (number of columns/2). Feature vectors can be constructed using mean and standard deviation. If we got square matrix A and A_i is the sub matrix from it, calculate F-norm based on F-norm theory

$$\text{Mean} = \sum F\text{-norm} / \text{no of columns of F-norm}$$

$$\text{Standard Deviation} = \sqrt{\frac{\sum (F\text{-norm} - \text{Mean})^2}{\text{No of columns of Fnorm}}}$$

A typical content-based retrieval the system automatically extracts visual attributes and saves to the cluster file. Image retrieval the system returns all relevant images to query image based on minimum “Euclidean distance [6].

CBIR Algorithm

Purpose: Retrieving most matching image to input image.

Input: Query image.

Output: Most matching image to the input image.

Procedure:

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Step 1: The input image.

Step 2: Find the feature vector for the input image

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Vol. 6, Issue 3, March 2017

- Step 3: Calculate the weighted features vectors for the input image.
- Step 4: Calculate the distance between the input image and the centroid of each K-mean cluster and find the smallest distance.
- Step 5: Find the smallest distanced image by calculating the distance between the query image and the images in the cluster file
- Step6: Retrieve most matching image to the input image.

III. PROBLEM DEFINITION

In a typical CBIR system, low- level visual image features that is colour, texture, and shape are automatically extracted for picture descriptions and indexing purpose. To search for desirable images, a user need to presents an image as an example of similarity, and the system returns a set of similar images based on the extracted features the main issue with CBIR system is the time of image retrieval in almost all CBIR systems depends in a large degree on the number of images in the cluster file. Two main issues with CBIR systems are efficiency and accuracy. Hence, an effective CBIR system needs to have an efficient search mechanism and also accurate set of features. Out of all the mechanisms used in CBIR, k-means clustering is found to have better efficiency and accuracy

IV. PROPOSED SYSTEM

System overview

Proposed system architecture is shown in Fig.3. The proposed system uses Haar cascade classifier for face detection and CBIR algorithm for image training and face recognition. Here the advantages of Haar cascade classifier and CBIR algorithm are applied in the social networking sites for better performance.

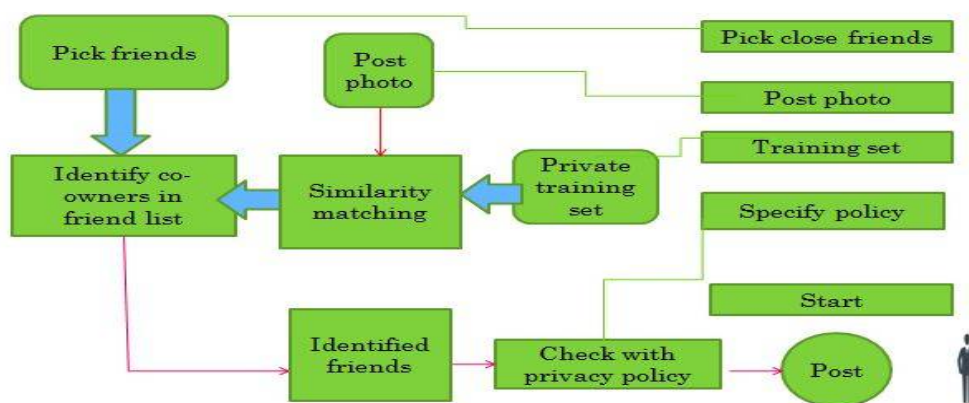


Fig.3 Proposed system architecture

Start

User or admin can login to this system if they have a valid user id and password. Admin's and user's collaboration diagrams are shown in Fig.4 (a) and Fig.4 (b). These diagrams explain the entire work flow of user and admin. Admin and user can login with a valid login id and password, once login admin can view the user details ; main function of admin is to train the user image and user can explore all the features of this system.

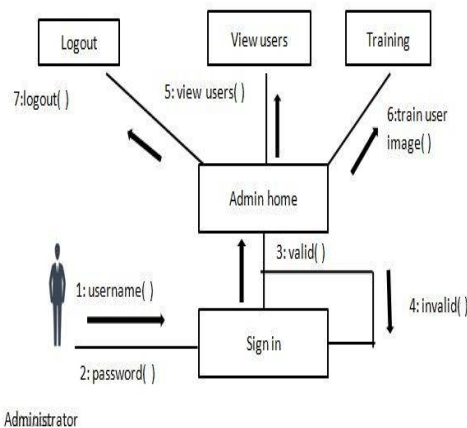


Fig.4 (a) Admin collaboration diagram

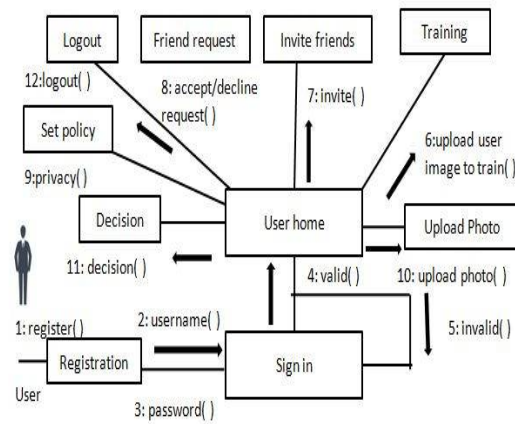


Fig.4 (b) User collaboration diagram

Specify policy

In our project we set two types of policies, first one personal policy, here we can set how many can see the photos on our time line .there are two options first is set public and next is view my friends. If a user is selection public option, once photo is uploaded that photo will be shown publically, if he/ she is setting only my friends option then once the photo uploaded photo will be available in the time line of his/her friends home page, and second policy indicates the set of users who can participate in a decision making while a photo is being uploading. In our project we limited this facility within the close friend list [1]

Training

Haar cascade classifier and CBIR (content based image retrieval) algorithm are used in the proposed system for face detection and recognition. FR engine with advanced recognition ratio demands more training samples. In the training phase, both decomposition and feature extraction takes place. Haar Wavelet Transform is used for calculating the feature vectors. Then k-means clustering algorithm is used for clustering the images based on their feature vectors, considering the minimum Euclidean distance. [7]

Algorithm for K Means Clustering:

1. Determine the initial centroid coordinate
2. Determine the distance of each object to the centroid
3. Group the object based on minimum Euclidean distance.

Pick friend

User can search through this social networking site to get friends, there is an invite friend option is there to find friends.

Photo Uploading

When posting a photo on online social network an automatic acceptance notification is sending to the co photograph owners in the close friend circle to inform their presence in that photo, thus each co-photo owners are able to view the photo before the up loader post the photograph, if all are pressing acceptance button, then only the photo will be posted. More over we set a time limit for the notification acceptance, the reason behind this is if co-photo owners are not login to this system for long, the one who trying to upload a photograph will be a failure, if the time limit is exceeded the photo will be uploaded automatically. Sometimes the co-photo owners are unable to login to this account within the

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Vol. 6, Issue 3, March 2017

time limit, so to avoid this issue we can add SMS notification option to inform each co-photo owners about the photo uploading and time limit, so it is useful them to login to the system and either accept or reject the notification. It can be added in future enhancement.

Proposed Algorithm

Purpose: Retrieving most matching images to input image.

Input: Image of a group photograph

Output: Most matching image to the input image.

Procedure:

Step 1: The input image, which containing one or more faces.

Step 2: Detecting all faces in the image.

Step 3: Create feature vector for all detected faces in the input image

Step 4: Calculate the weighted features vectors for the input image.

Step 5: Find the smallest distanced image by calculating the distance between the query image and the images in the cluster file

Step 6: The most similar image to the input image is retrieved, send acceptance notification to co-photo owners within the close circle.

V. PERFORMANCE ANALYSIS

This section, analyse the overall performance of the proposed system by computing the performance score for each module in the system. The performance analysis graph is shown in Fig.5. X coordinates includes the main modules used in the system .Y coordinates represent the time taken (in seconds) for each modules in X coordinates. The modules used for the performance analysis are image training, face detection, face recognition. Then plot the performance graph with time in milliseconds.

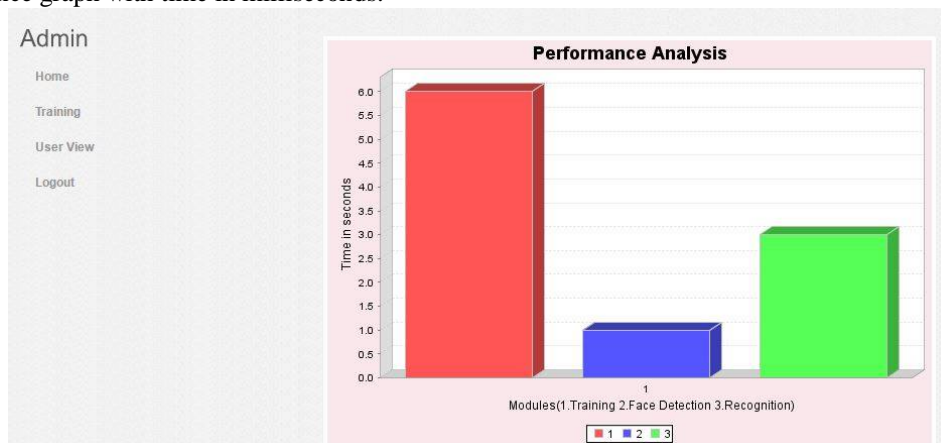


Fig.5 Performance analysis of proposed system

VI. CONCLUSION

Photograph sharing is one of the most popular features in online social networks such as Facebook. Lamentably, careless photograph posting may expose security of humans in a posted photograph. To control the security spillage, we proposed to empower people possibly in a photograph to give the consents before posting a co-photograph our

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Vol. 6, Issue 3, March 2017

future work could be the way to move the proposed plans to individual mists like Dropbox and/or icloud.and the same face recognition concept can be used to prevent privacy leakage while uploading videos.

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