ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

Privacy-Preserving of Photo Sharing in a Tagged World

V.S.KrithikaaVenket, R.Chithra Devi, P.Sahana

PG Student (M. Tech-II Year), Dept. of Information Technology, Dr.Sivanthi Aditanar College of Engineering, Tiruchendur, India

Assistant Professor, Dept. of Information Technology, Dr.SivanthiAditanar College of Engineering, Tiruchendur, India

PG Student (ME-II year), Dept. of Computer Science and Engineering, Dr.SivanthiAditanar College of Engineering, Tiruchendur, India

ABSTRACT: A popular feature of many Online Social Network (OSN) is photo tagging and photo sharing that allows users to annotate the images who are present in the uploaded images. User's privacy may leak, once when the photos are shared and that are allowed to post, comment and tag. To overcome this leakage, a Facial Recognition (FR) system has been designed effectively. Using of FR system is superior to some possible approaches in terms of increase in recognition ratio and efficiency. To achieve this, OSN specifies a privacy policy and exposure policy. By these policies, individuals are enabled in a photo by providing permissions before posting a co-photo. Exploring computational techniques and confidentiality of training sets that takes advantage of these trends seems a worthwhile endeavor. Finally, the system protects user privacy in photo sharing over Online Social Network.

KEYWORDS: Online Social Network, annotate, photo privacy, face recognition, photo sharing

I. INTRODUCTION

Facebook is the largest photo sharing site on the Internet with 1 billion photos uploaded monthly. Integrating photo sharing within social network sites has also provided the opportunity for user-tagging, annotating and linking images to the identities of the people in them. Online Social Network (OSN) have become integral part of our daily life and has profoundly changed the way we interact with each other, fulfilling our social needs–the needs for social interactions, information sharing, appreciation and respect.

"Photo Tagging" is a popular feature of many social network sites that allows users to annotate uploaded images with those who are in them, explicitly linking the photo to each person's profile. It is a nature of social media that makes people put more content, including photos, over OSNs without too much thought on the content. The act of labeling identities on personal photos is called "Face Annotation" or "Name Tagging". There is no restriction with sharing of co-photos, on the contrary, social network service providers like Facebook are encouraging users to post co-photos and tag their friends in order to get more people involved.

II. RELATED WORK

The study the statistics of photo sharing on social networks and propose a three realms model[4],[5]: "a social realm, in which identities are entities, and friendship a relation; second, a visual sensory realm, of which faces are entities, and co-occurrence in images a relation; and third, a physical realm, in which bodies belong, with physical proximity being a relation." They show that any two realms are highly correlated. Given information in one realm, we can give a good estimation of the relationship of the other realm. In[2], [3], Stone et al., for the first time, propose to use the contextual information in the social realm and cophoto relationship to do automatic FR. They define a pairwise conditional random field (CRF) model to find the optimal joint labeling by maximizing the conditional density. Specifically, they use the existing labeled photos as the training samples and combine the photo cooccurrence statistics and baseline FR score to improve the accuracy of face annotation. In [6], Choi et al. discuss the difference between the traditional FR

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

system and the FR system that is designed specifically for OSNs. They point out that a customized FR system for each user is expected to be much more accurate in his/her own photo collections. A similar work is done in [5], in which Choi et al. propose to use multiple personal FR engines to work collaboratively to improve the recognition ratio. Specifically, they use the social context to select the suitable FR engines that contain the identity of the queried face image with high probability.

III. PROPOSED APPROACH

OSN plays an important role in sourcing of image annotations and that provides information about social interactions among individuals for automatic image understanding. Now a days innumerous of photos and context are drawn from Online Social Network such as Facebook etc. Many Facebook photos contains people, and these photos are extreme challenge for the datasets present in face recognition system. Privacy management is not about setting rules and enforcing them; rather, it is the continual management of boundaries between different spheres of action and degrees of disclosure within those spheres. Boundaries move dynamically as the context changes. These boundaries reflect tensions between conflicting goals; boundaries occur at points of balance and resolution. The significance of information technology in this view lies in its ability to disrupt or destabilize the regulation of boundaries. Information technology plays multiple roles Face recognition in personal photos is a relatively mature topic in computer vision, and recognition rates on moderately large databases captured under controlled view and lighting conditions can be quite high. However, in personal photographs, the conditions are rather uncontrolled, faces exhibit a wide range of pose, expression, illumination, and makeup variation that is difficult for recognition systems to handle.Recognition rates in such uncontrolled settings are improving thanks to ongoing developments in face detection and alignment, feature extraction that is insensitive to changes in pose, expression, and illumination, and face-specific metric learning and classification. The use of private photos in a privacy-preserving manner and social contexts is to derive a personal FR engine for any particular user. The research is being spurred by the collection and dissemination of Standards [data sets containing hundreds or thousands of individuals]. In parallel to these advances, there has been interest in understanding as we seek to do, when and how contextual information of various forms can be used to improve recognition.

IV. POLICIES

To achieve this, OSN users are asked to specify a two policies. One is Privacy policy and the other is Exposure policy. These two policies will together mutually specify how a co-photo could be accessed. However, before examining these policies, finding identities in co-photos is the first and probably the most import step

A.Privacy Policy
Privacy policy is used to define group of users that are able to access a photo when being the owner. A request is send at the time of accepting a friend request, and the accepted friend is a close friend, this privacy policy request can be accepted by them and their photo can be shared by the owner at any time without giving request each and every time of posting the photos.

B. Exposure Policy
Exposure policy is used to define group of users that are able to access when being a co-owner. The exposure policy is treated as a private data that shall not be revealed, and a secure set intersection protocol is used to find the access policy. This is a type of request, where each time a request is send when the photos are posted on OSN.

V. FACE RECOGNITION (FR) SYSTEM

Traditional image search systems rely on the user specifying words to describe the images that they are looking for. A facial recognition system is a computer application for automatically identifying or verifying a person from a digital image or a video frame from a video source. One of the ways to do this is by comparing selected facial features from the image and a facial database. The majority of facial recognition solutions are based on a number of common approaches or algorithms. A common approach is to measure the relative distance between the eyes, ears and nose of a face detected in an image. These measurements are then used in an algorithm to derive other faces with similar features. Another approach is to use an image as a yardstick and applying templates of matching techniques.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

VI. FRAMEWORK

The application gets developed by PHP framework using WAMP server and SQLYOG as a backend for connectivity. SQLYOG act as a database for storing all the details. The framework of this system involes (i) User Login (ii) Add Friends (iii) Photo Sharing (iv) Photo posting.

A. User Login

A log in/out button could be used for log in/out with Facebook. After logging in, a greeting message and the profile picture will be shown. The user can login if they already have an Facebook account, if not they have to signup to have an account in Facebook. The login and Signup page has been devloped on the basis of Facebook front page, whereas new user can signup and the old user can use login menu for login to the facebook account. A new user details are stored in a database once when a signup button getsclicked. By the username and password the user can login using the login menu, if the given password and the stored password doesn't match user cannot login to the facebook.

The below figure shows the front page of the developed facebook account.

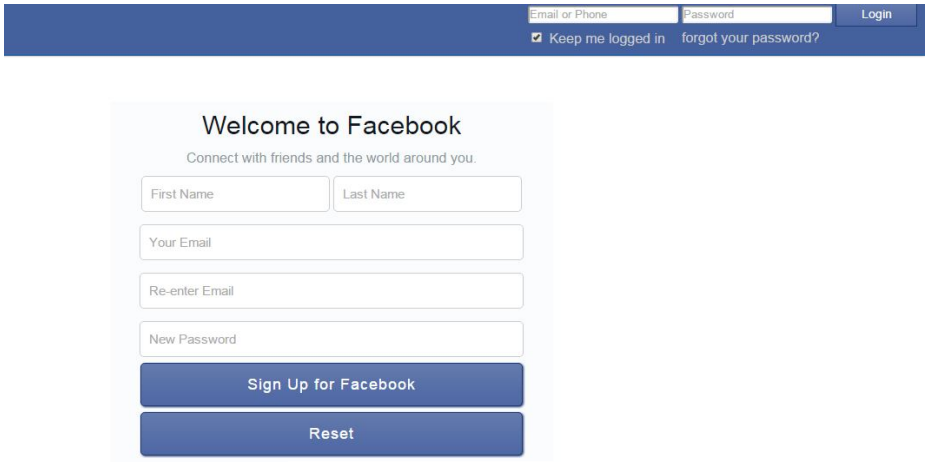


Fig 1: Signup/Login page

B. Add Friend

The friends are added to the Facebook circle by clicking "Add Friends" menu. Facebook allows us to create a list of friends such as "close friends" or "Acquaintances". We can share a photo only to friends on list. The friend list should be intersection of owner's privacy policy and co-owners' exposure policies

C.Photo Sharing

Photos are shared once a "post" button is clicked. Notifications are send along with requesting permission.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

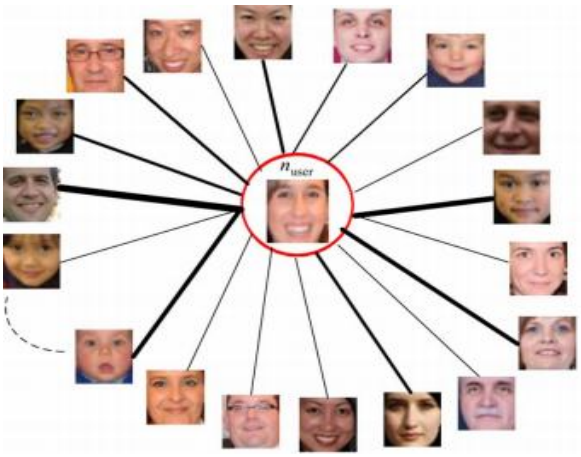


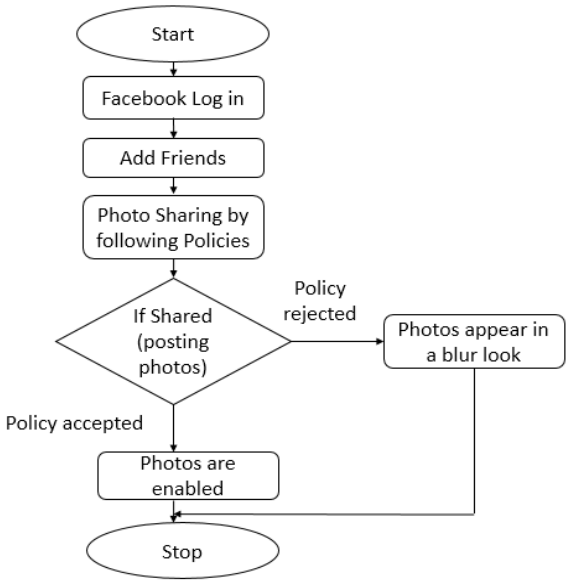
Fig 2: Sharing in OSN (displays who are all friend with current user)

The above (Fig 2) displays the friendlist of the one who have shared the photo. The center one is the user who have shared the photo and it displays the list of friends those who are friend with the user.

C. Photo Posting

The photo has been posted only after accepting the policy of privacy or exposure, the photo gets posted, if not the photo will be in a blur manner.

VII. FLOW CHART



VII. IMPLEMENTATION

The application is implemented on the basis of PHP as a front end and SQLYOG as a backend, by having Facebook as a platform.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

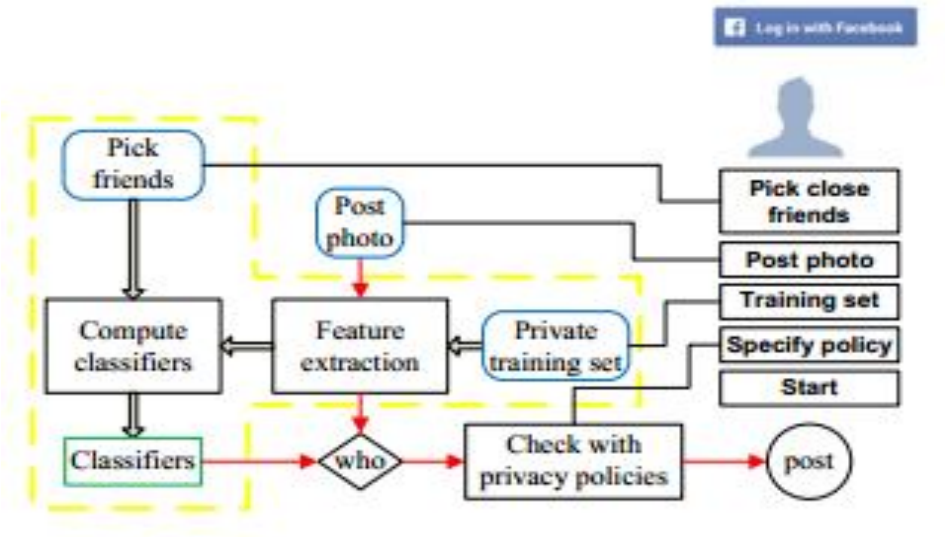


Fig 3: System Structure of the application

The system is evaluated with two criteria: network-wide performance and facial recognition performance. The former is used to capture the real-world performance of our design on large-scale OSNs in terms of computation cost, while the latter is an important factor for the user experience. The face detection and eigen face method is carry out by Face Recognition (FR) System. Fig 3 shows the graphical user interface (GUI) , A log in/out button could be used for log in/out with Facebook. After logging in, a greeting message and the profile picture will be shown. Our prototype works in three modes: a setup mode, a sleeping mode and a working mode.

Running in the setup mode, the program is working towards the establishment of the decision tree. For this purpose, the private training set and neighborhood need to be specified. When the "private training set" button is pressed, photos in the specified galleries could be selected and added. To setup the neighborhood at this stage, a user needs to manually specify the set of "close friends" among their Facebook friends with the button "Pick friends" as their neighborhood. According to the Facebook statistics, on average a user has 130 friends, we assume only a small portion of them are "close friends". In this application, each user picks up to 30 "close friends". Notice that all the selected friends are required to install our application to carry out the collaborative training. The setup mode could be activated by pressing the button "Start". Key operations and the data flow in this mode are enclosed by a yellow dashed box on the system architecture Fig.3.

After the classifiers are obtained, decision tree is constructed and the program switches from the setup mode to the sleeping mode. Facebook allows us to create a list of friends such as "close friends" or "Acquaintances". We can share a photo only to friends on list. The friend list should be intersection of owner's privacy policy and co-owners' exposure policies. That means we cannot customize a friend list to share a co-photo. Currently, when the button "Post Photo" is pressed, co-owners are identified, then notifications are send to the co-owners to request permissions. If they all agree to post, the owner shares the photo on the owner's page like a normal photo. In this sense, users could specify their privacy policy but their exposure policies are either everybody on earth or nobody depending on their attitude toward. The data flow for a photo posting activity is illustrated by the solid red arrows. After the requests are sent out, the program will go back to the sleeping mode.

VIII. VIOLA JONES ALGORITHM

Viola Jones Object Detection framework Proposed by Paul Viola and Michael Jones in 2001 was one of the first methods to provide object detection at very fast rates. It is the method for rapid and correct object detection through Adaboost machine learning. TheViola-Jonesface detection algorithm was used for detecting face images in personal photos. The accuracy of theViola-Jones face detection algorithm may be problematic depending upon the targeted

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

applications as well as the associated parameter setup. Hence, more advanced face detection techniques could be used in our face annotation framework(such as techniques that are robust against severe pose variation), thus allowing for more accurate face detection results.

A widely used method for real-time object detection in which each image contains 10-50 thousand locs/scales. This algorithm manually detected labelled face images of individuals who appear at least ten times in each photo collection used. Also, all of the detected face images were individually rotated and rescaled to 86x86 pixels using the center coordinates of the eyes.The algorithm has four main stages

(i) Haar Features Selection.
(ii) Creating Integral Image.
(iii) Adaboost Training algorithm.
(iv) Cascaded Classifiers.

The major features of Viola Jones Algorithm are

- Integral Image Representation : Rapid Detection of Objects requires computation of haar features and in order to compute them, integral image is required. Integral image is obtained using few operations per pixel. After this computation, Haar features of any type can be computed in constant time.
- The Adaboost Learning algorithm, which created efficient classifiers from set extracting important visual features. For fast classification, learning must exclude a majority of features that are available. This algorithm extracts critical features while discarding all other unimportant features.
- The "cascade" classifier which focuses on Object like parts and discards the background Cascade is a type of mechanism that knows its region of attention and discarded region are not likely to contain any object. This is very fast in Real Time detection.

A. Skin Detection

The detected face region of interest is converted from RGB colour space to HSV and YCrCbcolour space for detecting the skin percentage. Locating and tracking human faces is a prerequisite for face recognition and/or facial expressions analysis, although it is often assumed that a normalized face image is available. For detecting face there are various algorithms including skin color based algorithms. A new algorithm based on skin color classification in RGB, YCbCr and HSI color models. Results of comparative experiments show that there are some pros and cons in each of the algorithms. So we have taken the combination of the three results to find the skin region and then from the skin region facial features have been extracted to get the face from the skin region.

B. YCbCr Color space

YCbCr color space has been defined in response to increasing demands for digital algorithms. The family includes others such as YUV and YIQ. YCbCr is a digital color system, while YUV and YIQ are analog spaces for the respective PAL and NTSC systems. These color spaces separate RGB (Red-Green-Blue) into luminance and chrominance information and are useful in compression applications however the specification of colors is somewhat unintuitive. The Recommendation 601 specifies 8 bit (i.e. 0 to 255) coding of YCbCr, whereby the luminance component Y has an excursion of 219 and an offset of +16. This coding places black at code 16 and white at code 235. In doing so, it reserves the extremes of the range for signal processing foot room and headroom. On the other hand, the chrominance components Cb and Cr have excursions of +112 and offset of +128, producing a range from 16 to 240 inclusively. The rules for YCbCr skin color levels (Cb, Cr: two Chroma components from R, G and B levels):

$$\mathbf{97.5} \leq \boldsymbol{Cb} \leq \mathbf{142.5}\boldsymbol{and}\mathbf{134} \leq \boldsymbol{Cr} \leq \mathbf{176}.$$

The Viola Jones Algorithm is concluded from the experimental results and analysis that the improvementswere applied as skin detection, skin percentage and the eye detection. The skin and eyes play an important role for enhancing the efficiency of Viola Jones Algorithm. As a result, tilted as well as frontal faces are detected. The efficiency of the algorithm becomes 88.89% when noise is present in an image otherwise the detection is almost 100%, which is not done in Viola Jones Face Detection.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2015

IX. CONCLUSION

Photo sharing on social network sites has grown tremendously to over a billion new photos a month. Yet the tagging of photos on social network sites such as Facebook has caused users to lose control over their identity and information disclosures. Users are forced to accept the resulting problems because of a strong desire to participate in photo sharing. Personal photos are highly variable in apperance but are increasingly shared online in social networks that contain a great deal of information about the photographers, the people who are photographed, and their various relationships.Finally the privacy preserving FR system identifies individuals in the Co-photo and protects users privacy in photo sharing over Online Social Network.

REFERENCES

1. Besmer and H. Richter Lipford. Moving beyond untagging:photo privacy in a tagged world. In Proceedings of the SIGCHIConferenceon Human Factors in Computing Systems,CHI '10, pages1563–1572, New York, NY, USA, 2010. ACM.
2. 2.ZHI. Stone, T. Zickler, and T. Darrell. Toward large-scale face recognition using social network context. Proceedings of the IEEE 98(8):1408–1415.
3. 3.Z.Stone, T. Zickler, and T. Darrell. Autotaggingfacebook: Social network context improves photo annotation. In Computer Vision and Pattern Recognition Workshops, 2008. CVPRW'08. IEEE Computer Society Conference on, pages 1–8. IEEE, 2008.
4. 4.L. Palen. Unpacking privacy for a networked world. pages 129–136. Press, 2003.
5. 5.K. Choi, H. Byun, and K.-A. Toh. A collaborative face recognition framework on a social network platform. In Automatic Face Gesture' Recognition, 2008. FG '08. 8th IEEE International Conference on, pages 1–6, 2008.
6. 6.J. Y. Choi, W. De Neve, K. Plataniotis, and Y.-M. Ro. Collaborative face recognition forimproved face annotation in personal
7. photoCollectionshared on online social networks Multimedia, IEEE Transactions on,13(1):14–28, 2011.
8. M. Jones and P. Viola, "Rapid Object Detection using a Boosted Cascade of Simple Features Computer Vision and Pattern Recognition,
9. 2001. Proceedings of the 2001 IEEE Computer Society Conference ,vol I, pp. 511- 518, 2001.
10. 8.K. Thomas, C. Grier, and D. M. Nicol. unfriendly: Multi-party privacy risks in social networks. In M. J.Atallah and N. J.Hopper,
11. Editors, Privacy Enhancing Technologies,volume 6205 of Lecture Notes in Computer Science, pages 236–252. Springer, 2010.
12. 9. S. Wang, Amr and Abdel-Dayem, "Improved Viola-Jones Face Detector," ICCIT-7thInternational Conference onComputer Sciences
13. and Convergence Information Technology, pp. 124-126, 2012.