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Trustworthy Approach for Online Social Networks using Data mining

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Abstract: Online Social Networks is an active & important research area in the recent years. It is a platform to build social relations among people who share similar interests, activities, backgrounds or real-life connections. Social interactions among users are constructed basically on the trust. Social trust implies that users behave according to the expectation of other users, are trustworthy and expect trust from other users. As two users interact with each other frequently, their relationship strengthens & trust evolves based on their experience. The objective of the project is to develop a secure social networking with decision support system to identify trustworthy friends. We need to identify trustworthy people in order to protect user's important information from being misused. We define trust relationships by how much we trust the content posted or broadcasted by our friends. Depending on the past user interactions and profile similarity, we measure the trust values. Trust values are maintained by user & are calculated according to their own experiences & information from social relationships contacts. In this project, we can find trustworthy friends based on ratings review, based on which user can make decisions & provide access permissions to trustworthy users only.

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INTRODUCTION

Due to rapid advancement of technologies, online social networks are significantly gaining popularity. OSNs focus on reflecting and building of social networks or relations among people sharing same interests, activities or backgrounds. It promotes interaction between users like sharing ideas, pictures, posts, activities, events and interests with people in their network. Facebook, Twitter, MySpace etc are the sites currently dominating the field of social networking. OSNs allow users to share a lot of information among the people in their network. The increasing tendency of people to use online social networks has lead to collection huge amount of information being available (Nandi and Das, 2014). This gives rise to the concept of information overload. To handle such massive, complex and frequently changing social network data, a technique called information filtering is used. Information filtering can help in obtaining the most appropriate information efficiently (Javier et al., 2012).

Social interactions among users are constructed basically on the trust. Trust is considered as an important property of social networks. Trust among users in social networks has been of high interest, not just in computer science, but in psychology and sociology as well. There are various elements of trust such as predictability, confidence, bonding, competence, reputation, positive intensions and ethics. Social trust implies that users behave according to the expectation of other users, are trustworthy and expect trust from other users. Trust is crucial factor in the interaction between users. As two users interact with each other frequently, their relationship strengthens & trust evolves based on their experience. If the experience is positive, trust between members increases otherwise decreases. Trust can be classified into two categories:

a) Direct trust: It is based on direct experience of members with other party.

b) Recommendation based trust: It is based on experience of other members in social network with other party.

Literature Survey

OSNs focus on reflecting & building of social relations among people sharing similar interests, activities or backgrounds. Now-a-days, social networks and trust are used to generate recommendations for users. In such cases, trust is used directly used to generate the recommendation in decision support systems. There is need of accurate estimate of trust, if it is used in decision support systems (Abhishek et al., 2012). Major researches have been conducted worldwide to find mechanisms for inferring the trust. A brief review of some recent researches is presented as follows:

(Young Ae Kim et al., 2012) proposed a computational social trust framework that measures a degree of trust based on users' expertise & preference regarding topics & users feedback rating data which are much denser than a Web of Trust. The algorithm uses only user feedback rating data

on content. The trust prediction framework can be applicable to most of the rating based experience sharing online communities.

(F. Javier. Ortega et al., 2012) proposed a novel system intending to propagate both positive & negative opinions of users through a network in such a way that opinions of users about each other influence their global trust score. Their approach intends to compute ranking of users in social networks regarding trustworthiness, denoting the users who present dishonest behavior in the system. They implemented PolarityTrust algorithm, derived from PolarityRank, which is similar to PageRank algorithm, but extends in functionalities to handle graphical representation with positive & negative edges. Additionally, they also implemented EigenTrust algorithm, to reduce the number of inauthentic files downloads in peer-to-peer networks.

(Young Ae Kim, 2015) proposed an enrich trust propagation approach by combining a homophily based trust network with an expertise based trust network that enhances the density of the trust network. They normalized & transformed trust values so they can be compared with long chains as well as a single user. They adopted homophily based trust network that has potential to increase coverage & accuracy in trust propagation, also reduce the sparseness of trust values.

(Tomas Knap et al., 2010) proposed a mechanism to persist topic based trust in a FOAF (Friend of a friend) network, surveying the topic hierarchies suitable for classifying the topics used in the trust model & also proposed TopicTrust algorithm (TTA) to compute trust with respect to the particular topic.TTA involves two algorithms: TTLA, which computes initial trust value for all edges between given nodes, topic & topic forest. TiTA computes trust values based on the formula that is used in TidalTrust Algorithm.

(Sama Al-Oufi et al., 2012) proposed the extended Advogato trust metric that facilitates the identification of trustworthy users associated with each individual user. They introduced the capacity first maximum flow method for finding strongest path to discover an ordered set of reliable users. This method can benefit social network services such as controlling access permissions, recommending new friends etc.

PROPOSED WORK

OSNs promotes interaction between users like sharing ideas, pictures, posts, activities, events and interests with people in their network. However, there are different kinds of users in OSNs, which arises question that whether sharing of our important information with other users is reliable or not & whether that user is trustworthy. There is need for identifying the trustworthy people in order to protect users' large amount of information being misused by unreliable users. Users in OSNs want to share information & experience with as many reliable& trustworthy people in their network, while preventing access from unreliable users. We are introducing the concept of trust in social networks where users can identify trustworthy friends. Trust based decision support systems focus on trustworthy value on relation among users to make more reliable and accurate recommendations.
The objective of the project is to develop a secure social networking with decision support system to identify trustworthy friends. We define trust relationships by how much we trust the content posted or broadcasted by our friends. Depending on the past user interactions and profile similarity, we measure the trust values. In our proposed system, there are number of users and an admin. Various users can perform social activities such as create profile, list of users with whom to share connections etc. The system consisted different modules discussed as follows:

A. Admin:

The Admin has mainly two important tasks in the system:

1. To view & manage the entire users list such as number of users who have registered, logged in-out etc.
2. To manage the space consumed by user documents

B. Trust evaluation:

Trust evaluation can be done in following two ways:

a. Person's Nature: Before accepting any friend request user can check any person's system generated trustworthy reports

b. Communication: If content in any message sent by any friend seems to be suspicious, system will worn user about particular message

C. Category & Document Management:

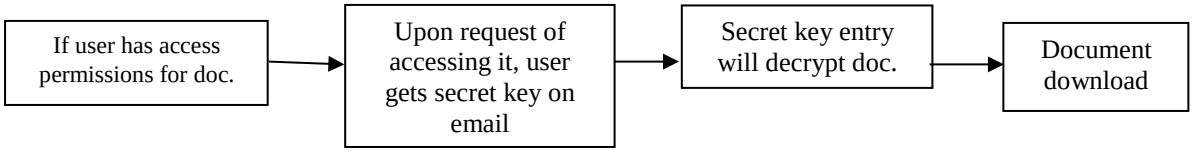

Fig.1: File Encryption/Decryption Process

In this module, various categories can be registered. Users can upload category wise documents. When the document is uploaded, it gets stored on the server in an encrypted format so that they are not accessible to undesirable people. If the user has access permission to documents, he/she can download it using a secret key.

D. Undesirable group management:
If user does not trust on a particular friend & don't want to share his documents, user can send that person to undesirable group. The person whose name is specified in undesirable group cannot access any information regarding that user. User can add/remove friend from undesirable group at any time.

E. File Encryption/Decryption:
Users' documents will be stored on server in an encrypted format using Password based encryption technique with AES (Advanced encryption standard) algorithm. If use ahs access permission of document & wants to decrypt it, he/she will get a secret key on email. After specifying secret key, particular document will get decrypted and user can access it.

There are two types of login provided to customers for security purpose. In first login, user can change his profile and password when required. The second login is SocialZone login, where user can perform all sort of social activities such as sending friend requests, accepting friend requests using DSS reports, group management, posting messages to friends, specifying access permissions to friends, giving rating to friends, grant/ revoke document access permissions. In the SocialZone, a recommendation is given to users to add friends who have similar hobbies, educational qualifications & profession. Users can view a list of them & can send requests too. Users can give ratings & feedback to friends, which can help in reviews generated on processing friend requests & providing access permissions. When document is uploaded, it is saved in encrypted format on the server; user who has access permission can download it upon entering the secret key generated on email.

RESULTS

Following are the experimental results. Fig. 2 shows ratings review for user Koyal Mathur. Using these ratings review, user Sandhya can decide whether to approve or reject Koyal.

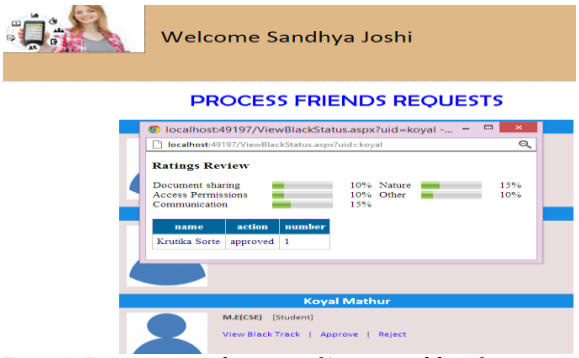

Figure 2: Ratings review for approval/rejection of friend request

In figure 3, Friends Ratings are shown for user Sandhya. Along with ratings, various actions performed such as earlier sandhya was approved, rejected or some suspicious content was found are also mentioned. Using these ratings user Krutika can make decisions whether she can share her documents with sandhya or not.

Fig. 3: Friends ratings which can be referred before giving any access permissions to user.

In figure 4, User Krutika uploads document in group ME (CSE) & provides access to members whom she feels trustworthy.

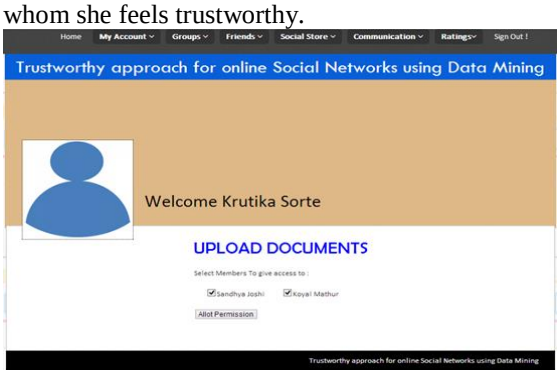

Fig. 4: Document Upload Access Permissions

In figure 5, user Koyal, who has access permission to view documents of user Krutika, can view & download newprojguidelines1005_enc.pdf.

Fig. 5: Access permissions of Friends documents

In figure 6 & 7, user Koyal needs to submit the secret key generated on email.

Fig. 6: Secret key generated on email of user Koyal.

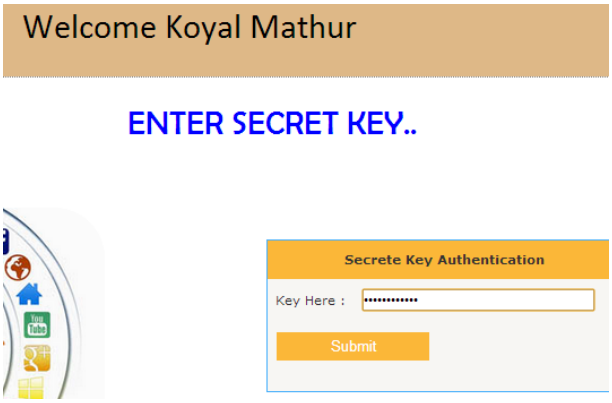

Fig. 7: Secret key Entry

Figure 8 shows the document which was provided with secret key can be viewed by user Koyal.

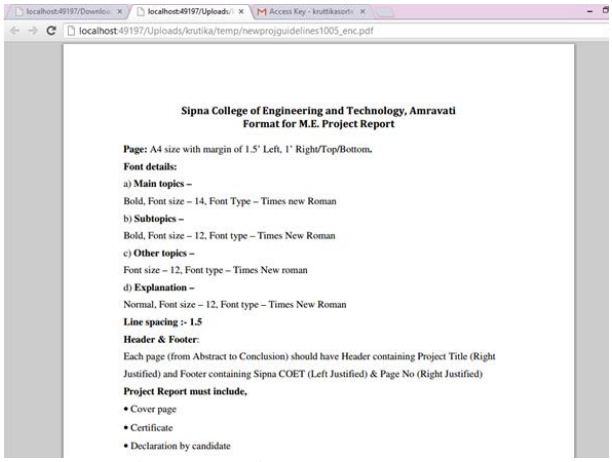

Fig. 8: View of Document after providing secret key generated on email of user Koyal.

CONCLUSION & FUTURE SCOPE

Social trust is emerging as active & important topic, but yet not understood from computational perspective. Trust and confidence can help the decision maker rank information and determine which is certain to be acted upon. In our project, ratings review can help in making decisions whether to trust particular user or not. And further, the access permissions can be granted. With the increasing popularity of OSNs, new trust inference mechanisms and recommendations algorithms will be needed to properly mine various kinds of newly available social information. In future, more work can be done by adding opinion mining & sentiment analysis. Feedback taken from users can positive/negative, based on that opinion mining & sentiment analysis can be implemented More mechanisms can be implemented to quantitatively and qualitatively increase the performance of measuring trust. One of the steps will be to test & improve performance in real online social networks with real-time user experience feedback. Still, developing methods for accurately estimating trust between people is important for the future system.

REFERENCES

F. Javier. Ortega, Jose A. Troyano, Fermin L. Cruz, Carlos G. Vallejo, Fernando Enriquez. (2012). Propagation of trust & distrust for detection of trolls in social networks. Computer network (56), 2884-2895.

G Nandi, A Das, (Apr-2014).Online Social Network Mining: Current Trends and Research Issues, Volume: 03 Issue: 04, eISSN: 2319-1163, 346-350

Kumar Abhishek, Saurabh Kulkarni, Vipin Kumar. N Archana, P. Kumar, (2011) A Review on Personalized Information Recommendation System Using Collaborative Filtering, Vol. 2 (3), 1272-1278

Sama Al-Oufi, Heung-Nam Kim, AbdulMotaleb El Saddik. (2012)A group trust metric for identifying people of trust in online social networks. Expert system with applications (39), 13173-13181.

Tomas Knap, Irena Mlynkova. (2012).Towards topic based trust in social networks.UIC-2010, LNCS 6406, 635-649

Ugur Kuter, Jennifer Golbeck, (2007)" SUNNY: A New Algorithm for Trust Inference in Social Networks Using Probabilistic Confidence Models", Association for the Advancement of Artificial Intelligence (www.aaai.org).

Young Ae Kim (2015). An enhanced trust propagation approach with expertise & homophily based trust network. Knowledge based system(81) pp. 20-28

Young Ae Kim, Rasik Phalak, (2012) A trust prediction framework in rating based experience sharing social network without a web of trust, Information sciences(191), 128-145