

PRIVACY POLICY INFERENCE MODEL USING ENHANCED PARENT CONTROL ALGORITHM

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Abstract—Images are now one of the key enablers of users' connectivity. Sharing takes place both among previously established groups of known people or social circles (e.g., Google+, Flickr or Picasa), and also increasingly with people outside the users social circles, for purposes of social discovery—to help them identify new peers and learn about peers interests and social surroundings. With the increasing volume of images users share through social sites, maintaining privacy has become a major problem, as demonstrated by a recent wave of publicized incidents where users inadvertently shared personal information. In light of these incidents, the need of tools to help users control access to their shared content is apparent. Toward addressing this need, we propose an Adaptive Privacy Policy Prediction (A3P) system to help users compose privacy settings for their images. This project examines the role of social context, image content, and metadata as possible indicators of users' privacy preferences. This project proposes a two-level framework which according to the user's available history on the site, determines the best available privacy policy for the user's content being uploaded. The solution relies on an image classification framework for image categories which may be associated with similar policies, and on a policy prediction algorithm to automatically generate a policy for each newly uploaded image, also according to users' social features. Online social networks (OSNs) have experienced tremendous growth in recent years. These OSNs offer attractive means for digital social interactions and information sharing, but also raise a number of security and privacy issues. While OSNs allow users to restrict access to shared data (policy mining), they currently do not provide any mechanism to enforce privacy concerns over data associated with multiple users. In addition, it analyzes how the approach can affect the effectiveness of a policy-based collaborative tagging system that supports enhanced web access functionalities, like content filtering and discovery, based on preferences specified by end users.

Keywords— Online information services, web-based services

I. INTRODUCTION

The Internet and online social networks, in particular, are a part of most people's lives. eMarketer.com reports that in 2011, nearly 150 million US Internet users will interface with at least one social networking site per month. eMarketer.com also reports that in 2011, 90 percent of Internet users ages 18-24 and 82 percent of Internet users ages 25-34 will interact with at least one social networking site per month. This trend is increasing for all age groups. As the young population ages, they will continue to leverage social media in their daily lives. In addition, new generations will come to adopt the Internet and online social networks. These technologies have become and will continue to be a vital component of our social fabric, which we depend on to communicate, interact, and socialize.

Not only are there a tremendous amount of users online, there is also a tremendous amount of user profile data and content online. For example, on Facebook, there are over 30 billion pieces of content shared each month. New content is being added every day; an average Facebook user generates over 90 pieces of content each month. This large amount of content coupled with the

significant number of users online makes maintaining appropriate levels of privacy very challenging. There have been numerous studies concerning privacy in the online world [11], [12]. A number of conclusions can be drawn from these studies. First, there are varying levels of privacy controls, depending on the online site.

For example, some sites make available user profile data to the Internet with no ability to restrict access. While other sites limit user profile viewing to just trusted friends. Other studies introduce the notion of the privacy paradox, the relationship between individual privacy intentions to disclose their personal information and their actual behavior [13]. Individuals voice concerns over the lack of adequate controls around their privacy information while freely providing their personal data. Other research concludes that individuals lack appropriate information to make informed privacy decisions. Moreover, when there is adequate information, short-term benefits are often opted over long-term privacy. However, contrary to common belief, people are concerned about privacy [14]. But managing ones privacy can be challenging. This can be attributed to many things, for example, the lack of privacy controls available to the user, the complexity of using the controls [15], and the burden associated with managing these controls for large sets of users. The paper enhances existing and introduces new privacy management models for online social networks. In addition, it measures the human effects of our improvements. It introduces three new improvements to privacy management models:

1. Assisted Friend Grouping—an incremental improvement to traditional group-based policy management.
2. Same-As Policy Management—a new paradigm improvement over traditional group-based policy management.
3. Example Friend Selection—an incremental improvement to Same-As Policy Management.

The thesis leverages traditional group-based policy management as our baseline and progressively improve upon this privacy management model. With each new enhancement, we measure their human effects including cluster/user defined relationship group alignment, user privacy sentiment, efficiencies and user perceptions. The thesis introduces a user-assisted friend grouping mechanism that enhances traditional group-based policy management approaches. Assisted Friend Grouping leverages proven clustering techniques to aid users in grouping their friends more effectively and efficiently. It introduces a new privacy management model that is an improvement over traditional group-based policy management approaches. The new paradigm leverages a user's memory and opinion of their friends to set policies for other similar friends, which we refer to as Same-As Policy Management. Users associate the policy with an example friend and in doing so have this friend in the forefront of their mind. This allows users to be more selective and careful in assigning permissions. Users are thinking of people, not groups. Using a visual policy editor that takes advantage of friend recognition and minimal task interruptions, Same-As Policy Management demonstrated improved performance and user perceptions over traditional group-based policy management approaches.

It further enhances Same-As Policy Management by introducing Example Friend Selection—two techniques for aiding users in selecting their example friends that are used in developing policy templates. Both techniques reduced policy authoring times and were positively perceived by users. In addition, the thesis proposes an approach to enable the protection of shared data associated with multiple users in OSNs.

II. LITERATURE SURVEY

Ales Sandro Acquisti Ralph Gross H. John Heinz[1] Online social networks such as Friendster, MySpace, or the Facebook have experienced exponential growth in membership in recent years. These networks offer attractive means for interaction and communication, but also raise

privacy and security concerns. In this study we survey a representative sample of the members of the Facebook (a social network for colleges and high schools) at a US academic institution, and compare the survey data to information retrieved from the network itself. We look for underlying demographic or behavioral differences between the communities of the network's members and non-members; we analyze the impact of privacy concerns on members' behavior; we compare members' stated attitudes with actual behavior; and we document the changes in behavior subsequent to privacy-related information exposure. We find that an individual's privacy concerns are only a weak predictor of his membership to the network. Also privacy concerned individuals join the network and reveal great amounts of personal information. Some manage their privacy concerns by trusting their ability to control the information they provide and the external access to it. However, we also find evidence of members' misconceptions about the online community's actual size and composition, and about the visibility of members' profiles.

Hong-Ming Chen, Ming-Hsiu Chang [9] Online photo albums have been prevalent in recent years and have resulted in more and more applications developed to provide convenient functionalities for photo sharing. In this paper, we propose a system named *SheepDog* to automatically add photos into appropriate groups and recommend suitable tags for users on Flickr. We adopt concept detection to predict relevant concepts of a photo and probe into the issue about training data collection for concept classification. From the perspective of gathering training data by web searching, we introduce two mechanisms and investigate their performances of concept detection. Based on some existing information from Flickr, a ranking-based method is applied not only to obtain reliable training data, but also to provide reasonable group/tag recommendations for input photos. We evaluate this system with a rich set of photos and the results demonstrate the effectiveness of our work.

Munmun De Choudhury, Hari Sundaram[10] We develop a recommendation framework to connect image content with communities in online social media. The problem is important because users are looking for useful feedback on their uploaded content, but finding the right community for feedback is challenging for the end user. Social media are characterized by both content and community. Hence, in our approach, we characterize images through three types of features: visual features, user generated text tags, and social interaction (user communication history in the form of comments). A recommendation framework based on learning a latent space representation of the groups is developed to recommend the most likely groups for a given image. The model was tested on a large corpus of Flickr images comprising 15,689 images. Our method outperforms the baseline method, with a mean precision 0.62 and mean recall 0.69. Importantly, we show that fusing image content, text tags with social interaction features outperforms the case of only using image content or tags.

Kristina Lerman, Anon Plangprasopchok, Chio Wong[21] The social media site Flickr allows users to upload their photos, annotate them with tags, submit them to groups, and also to form social networks by adding other users as contacts. Flickr offers multiple ways of browsing or searching it. One option is tag search, which returns all images tagged with a specific keyword. If the keyword is ambiguous, e.g., "beetle" could mean an insect or a car, tag search results will include many images that are not relevant to the sense the user had in mind when executing the query. We claim that users express their photography interests through the metadata they add in the form of contacts and image annotations. We show how to exploit this metadata to personalize search results for the user, thereby improving search performance. First, we show that we can significantly improve search precision by filtering tag search results by user's contacts or a larger social network that includes those contact's contacts. Secondly, we describe a probabilistic model that takes advantage of tag information to discover latent topics contained in the result.

Amit Singhal[31] For thousands of years people have realized the importance of archiving and finding information. With the advent of computers, it became possible to store large amounts of information; and finding useful information from such collections became a necessity. The field of Information Retrieval (IR) was born in the 1950s out of this necessity. Over the last forty years, the field has matured considerably. Several IR systems are used on an everyday basis by a wide variety of users. This article is a brief overview of the key advances in the field of Information Retrieval, and a description of where the state-of-the-art is at in the field. The practice of archiving written information can be traced back to around 3000 BC, when the Sumerians designated special areas to store clay tablets with cuneiform inscriptions. Even then the Sumerians realized that proper organization and access to the archives was critical for efficient use of information. They developed special classifications to identify every tablet and its content.

Kenan Xu, Hossam Hassanein[33] Online social networking communities such as Facebook and My Space are extremely popular. These sites have changed how many people develop and maintain relationships through posting and sharing personal information. The amount and depth of these personal disclosures have raised concerns regarding online privacy. We expand upon previous research on users' under-utilization of available privacy options by examining users' current strategies for maintaining their privacy, and where those strategies fail, on the online social network site Facebook. Our results demonstrate the need for mechanisms that provide awareness of the privacy impact of users' daily interactions.

Xiwang Yang[34] Recommendation plays an increasingly important role in our daily live. Recommender systems automatically suggest to a user items that might be of interest to her. Recent studies demonstrate that information from social networks can be exploited to improve accuracy of recommendations. In this paper, we present a survey of Collaborative Filtering(CF) based social recommender systems. We provide a brief overview over the task of recommender systems and traditional approaches that do not use social network information.

We then present how social network information can be adopted by recommender systems as additional input for improved accuracy. We classify CF-based social recommender systems into two categories: matrix factorization based social recommendation approaches and neighborhood based social recommendation approaches. For each category, we survey and compare several representative algorithms. Most of the surveyed algorithms are trained and tested offline. One of the next steps will be to test and improve their performance in real online social networks, with real-time user experience feedback. Finally, privacy in online social networks has attracted more and more user awareness. Privacy-preserving social recommender systems are another interesting direction for future work.

III. CONCLUSION

Study of this paper we have proposed system takes care of parental control based privacy preserving in various settings level also. For example, web content taken may be from more than one languages. So privacy preserving collaborative tagging if applied to content with multiple languages, then it becomes more effective to fruitful to end users. In addition, unlike existing system where the application is not developed for the experimental system a practical tool that offers significant improvements over current approaches to privacy.

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