

Improving the Privacy Settings Interface of Online Social Networks

Charisse Cotton
Computer Science Department
Tufts University
Medford, MA 02155
Charisse.Cotton@tufts.edu

ABSTRACT

Maintaining a sense of privacy while participating in online social networking can be very challenging. Social network sites like Facebook enable users to create and manage their own profile, while openly sharing large amounts of personal information among friends and strangers, leaving them subject to a range of risks. We propose a new prototype that presents a visual-based privacy settings interface. Our prototype will allow users to configure their privacy settings relatively easily and with greater understanding. Our research compares Facebook's current privacy settings interface to the prototype.

Keywords

Privacy settings interface, online privacy, social networking, Facebook.

1. INTRODUCTION

Cyberspace communities, such as Facebook and Myspace, continue to attract new users in spite of the many risks that are aligned with exposing one's personal information. Users that disclose large amounts of sensitive information onto the internet are at great risk of being subject to identity theft, harassment, stalking, blackmail and embarrassment. Our goal as researchers is to find ways to improve user's online security by presenting a different type of interface for managing profile privacy settings.

Many online social network sites allow users to take advantage of securing their private information by configuring their privacy settings, however many users know too little about the availability and usability of current privacy settings interfaces [2]. There are several possible reasons for why users may not fully take advantage of their privacy settings. We are prototyping a new interface with the idea that users will have a better experience with a visually-based privacy interface called Audience View. Our study will allow us to discover whether Audience View is easier to understand and easier to use than Facebook's interface. Our preliminary results, described here, indicate that this interface does improve the efficiency of modifying settings and is preferred by users.

2. MOTIVATION & BACKGROUND

Facebook is social network site that people use to communicate, share photos, connect with friends, post their profile information etc. Facebook is very popular and has experienced phenomenal growth in membership since it opened its doors to the general public. Previous studies have observed social networking sites like Facebook and evaluated the amount of personal information revealed by users. Previous studies suggest that users are putting enormous amounts of their personal business on the web but are unaware of who may actually be able to access their information [3, 5].

Information posted online by users of social networking sites "such as date of birth and where [they] work provide valuable clues for identity thieves, while status updates saying [they] are going on vacation could be tantamount to giving burglars the key to your house" [1].

A recent study of ours was conducted on Facebook's privacy settings interface. The outcome of our prior research revealed problems with Facebook's current interface. Often times, users are concerned about keeping their privacy secure, but generally struggle with managing their privacy and can unintentionally release personal information. Users expressed that the interface was confusing and took a lengthy amount of time to configure [5]. We propose to improve the way users manage their privacy on Facebook and other sites by introducing an audience-based model. We aim to improve user's understanding and performance with how they configure of their privacy settings and reduce the unintentional sharing of private information [4].

3. AUDIENCE VIEW

Audience View is the name of our new prototype and we are comparing it to Facebook's current privacy settings interface [4]. Audience View was developed using java and created to look similar to Facebook. Although the prototype had already been developed prior to my summer

research at UNC Charlotte, I spent part of my internship coding recent improvements made to the prototype such as the subgroups to All My Friends, a third profile, and additional panels. In the following section, we present the details of Audience View.

3.1 FEATURES

3.1.1 Visual Representation

There are several features that separate Audience View from the rest of the current privacy interfaces that are in place. One of the most prominent features that Audience View currently has to offer allows users to configure their privacy settings based on a visual representation of what individual audiences can view. Users may toggle through options in the task bar to select which particular category of audiences that they want to configure privacy settings for. Users can choose from three specific categories; friends, networks and search. (Networks are the communities, schools and regions that users belong to).

3.1.2 Profiles

Similar to Facebook’s interface, Audience View displays the user’s profile. [Figure 1] A user’s profile consists of information such as their name, profile picture, online album, contact information, personal information, hobbies, work & educational information, current status, interests etc.

Figure 1. Screen Shot of Only Me audience

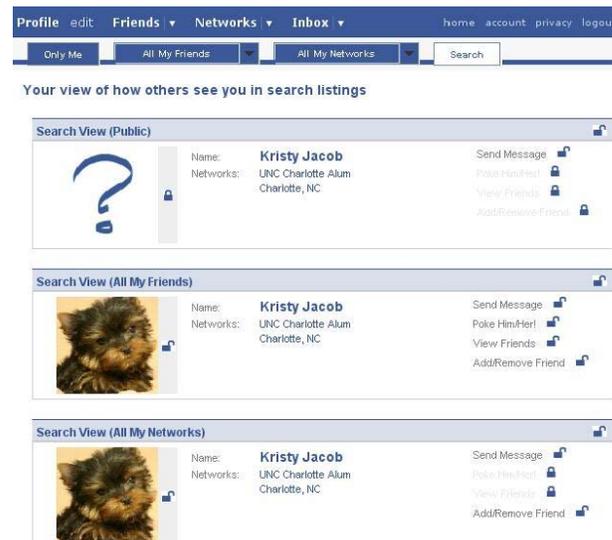


3.1.3 Task Bar

The task bar is located at the top of Audience View’s interface and is filled with four separate tabs. Users are able to select/highlight the tabs one at a time. Each tab is

labeled with the name of different types of audiences. Among this selection of audiences, users may choose from 1) Only Me, 2) All My friends, 3) All My Networks and 4) Search. When the Only Me tab is selected, users are shown the entire profile because they are the owner. When the All My Friends tab is selected, users are shown what parts of the profile their subgroups of friends can view. When the All My Networks tab is selected, users are shown what parts of the profile their subgroup of networks can view. When the Search tab is selected, users are shown parts of the profile that people searching for them can view.

Figure 2. Screen shot of the Search audience



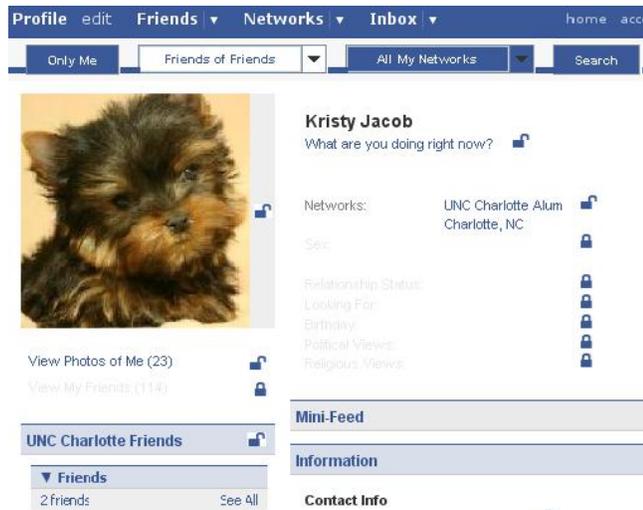
The task bar consists of two tabs that also function as a drop down menus. Each drop down menu can be found in the tabs labeled All My Friends and All My Networks which consists of the subgroups. For the purpose of our study, the subgroups located in the All My Friends tabs are Friends of Friends, Close Friends and Shady Friends. The subgroups located in the All My Networks tab are Charlotte, NC and UNC Charlotte.

3.1.3 Lock Buttons

Users have the ability to show or hide components from their profile with the click of a lock button. A user’s profile consists of pieces of information, such as their work information or a profile picture. In Audience View, each piece of information is paired with a lock box. The lock box symbolizes whether or not that information is or isn’t available to the selected audience. When the lock box is open, the selected audience has access to that information. For example, in figure 3, much of the user’s information is hidden. When the lock box is closed, the selected audience does not have access to that information. User’s may

permit or limit information in their profile by clicking on the lock box to alter between states of open and closed, revealed or hidden.

Figure 3. Screen shot of Friends of Friends audience, a subgroup of All My Friends.



3.2 Functionality

Among other things, Audience View also has propagation functionality that enables users to make relatively quick configurations. Users can configure privacy settings for All My Friends or All My Networks; however the configurations they set will propagate throughout the subgroups as well. [Figure 4] Users may also override the propagation settings. This can be accomplished by using the drop down menu to reveal their subgroups of friends or networks and individually lock or unlock pieces of information. For example, Kristy could hide her relationship status from all of her friends, but then select Close Friends and unlock that information.

Figure 4. Screen shot of All My Friends audience



4. METHODOLOGY

Our study compares Audience View with Facebook’s current privacy settings interface. Currently, we have interviewed ten participants and analyzed their performance with both interfaces.

4.1. The Study

The study takes approximately forty minutes for each participant to complete and consists of three sections. The first section of the study is a biographical questionnaire that is to be filled out by the participant. The second part of the study is a task questionnaire.

4.1.1 Task Questionnaire

Participants are given two sets of the same questionnaire. The order participants complete the same set of tasks for both Audience View and Facebook is counterbalanced. The order in which participants view the profiles and interact with each of the interfaces are also counterbalanced. We conduct the study in this manner to eliminate any bias or inconsistencies.

A single task questionnaire consists of ten questions. The first two questions of the questionnaire are observational. Participants are asked to navigate through the interface and, based on their observation, answers our questions. For example, an observational question might ask “Which of the following groups would be able to view your mobile phone number?” The remaining eight questions are configurative. Participants are asked to navigate throughout the interface and configure the privacy settings based on our requirements. For example, a configurative question

might ask “Please configure the privacy settings so that only your Friends and UNC Charlotte are permitted to view your email address.” The questionnaire also included questions asking participants to rate their confidence on a seven point scale for each task.

4.1.2 The Interview

The interviews were conducted after the participants completed the task questionnaire. We asked participants about what they liked and disliked about each of the interfaces. We also questioned participants about whether or not they were confused at any point of the study. Lastly, we asked participants if they had any comments or suggestions regarding possible improvements for our interface.

4.2 Analysis

Our analysis allowed us to observe several factors such as time, accuracy, and confidence. The analysis conducted primarily focused on the task questionnaires. We were able to record confidence levels and the amount of time it took the participants to answer questions three through ten. The percent of questions answered correctly was also recorded.

5. RESULTS

Table 1. Average level of confidence per question

| Averages: Confidence | | | |
|----------------------|----------|---------------|---------|
| | Facebook | Audience View | p-value |
| Q1 | 5.7 | 6 | 0.167 |
| Q2a | 6 | 6.8 | 0.005 |
| Q2b | 5.9 | 6.8 | 0.005 |
| Q2c | 6.1 | 6.8 | 0.124 |
| Q3 | 5.9 | 6.8 | 0.054 |
| Q4 | 6.7 | 6.3 | 0.187 |
| Q5 | 6.4 | 6.5 | 0.406 |
| Q6 | 5.9 | 6.8 | 0.141 |
| Q7 | 6 | 6.666 | 0.141 |
| Q8 | 6.666 | 6.1 | 0.364 |
| Q9 | 6.555 | 6.8 | 0.223 |
| Q10 | 6.333 | 6.8 | 0.112 |

Table 1 displays the average level of confidence reported by the participants per each question. We used a t-test to compare levels for each question. The data highlighted in yellow shows a slight difference in user’s confidence between Audience View and Facebook. The highlighted data shows that participants are more confident with their answer when using Audience View for questions two-a, two-b, and three.

Table 2. Average duration per question

| Averages: Time (sec.) | | | |
|-----------------------|----------|---------------|---------|
| | Facebook | Audience View | p-value |
| Q3 | 72.9 | 35.9 | 0.001 |
| Q4 | 47.5 | 57.4 | 0.440 |
| Q5 | 34.9 | 37.6 | 0.623 |
| Q6 | 74.6 | 32.6 | 0.002 |
| Q7 | 69.4 | 24.4 | 0.003 |
| Q8 | 73.1 | 27.4 | 0.001 |
| Q9 | 83.1 | 24 | 0.008 |
| Q10 | 89 | 33.3 | 0.017 |

Table 3 displays the average length of time it took participants to answer each question. We used a t-test to compare levels for each of these questions as well. Participants took twice as long to answer a majority of the task questions using Facebook’s interface. However, we believe that participants were not as fast when answering questions four and five because they had to navigate through a series of tabs to configure the privacy settings using Audience View. However, with Facebook’s privacy settings interface, the participants only needed to navigate to a single page.

Table 3. Average percent of questions answered correctly

| Averages: Accuracy | | |
|--------------------|----------|---------------|
| | Facebook | Audience View |
| Q1 | 82% | 62% |
| Q2 | 93% | 100% |
| Q3 | 20% | 70% |

| | | |
|-----------|------------|------------|
| Q4 | 90% | 50% |
| Q5 | 80% | 60% |
| Q6 | 90% | 80% |
| Q7 | 90% | 80% |
| Q8 | 60% | 90% |
| Q9 | 90% | 80% |
| Q10 | 90% | 100% |

Table 3 displays the average percent of questions answered correctly by participants. Unfortunately, the data showing significant results in the favor of Audience View are only two out of ten questions. While analyzing the data for accuracy, there were a number of inconsistencies with participants' answers. Although participants show a high level of confidence in their answers to each of the questions, a majority of the participants answered the questions differently. Some of the task questions specified which exact groups to restrict and permit certain profile information to, while other questions were not as specific.

As part of our analysis, we found that several questions presented in the task questionnaire were phrased too ambiguously. The questionnaire was originally worded this way so that participants could complete each task using either Audience View or Facebook's interface interchangeably. If all the questions were more specific, we believe that the results would have turned out considerably different.

6. DISCUSSION

Our results and responses from the study indicate that participants are equally confident with using both Audience View and Facebook's privacy interface. Although users are faster at configuring privacy settings with Audience View than they are with Facebook, they are not necessarily more accurate.

All of the participants that took part in the study expressed that they enjoyed working with Audience View. When asked to describe the two interfaces, several participants mentioned that Audience View is comparably more intuitive to operate.

Several participants also suggested improvements to the interface. One suggestion was to incorporate an

informative display box somewhere along the panel of the interface so that users would have a location that they could easily navigate to if they needed assistance with the interface. Another suggestion was to incorporate a master summary page and another tab. The additional tab would be labeled Summary. The Summary tab would link to a master page with an overview of all the updated privacy settings for every audience. Another idea was to implement a better response system that would do more than just highlight the tab whenever users selected a new audience, since several users expressed concerns over being able to tell which audience they were viewing.

7. CONCLUSION & FUTURE WORK

The first phase of our study has allowed us to collect a considerable amount of insightful information from the initial round of interviews. We have already begun revising the task questions to remove any ambiguity. Compared to Facebook's privacy settings interface, Audience View takes little effort and less time to configure. Although participants were not as accurate with configuring privacy settings in Audience View, we believe that will change once the task questions are revised. We are also using the suggestions from the post interviews to help improve the prototype. After the changes have been made, a second round of participants will be recruited for another round of interviews.

Currently, the research that we've conducted only includes Facebook as use for a comparison to Audience View. Hopefully the research will expand to include online social networks such as Myspace, Friendster etc. An expansion of the study would create an opportunity to improve online social network privacy interfaces across the board. This will allow researchers and developers to bring people one step closer to improving the way we secure our online privacy.

8. ACKNOWLEDGMENTS

I would like to thank the CRA-W and DMP for giving me the opportunity to intern at the University of North Carolina at Charlotte. I would like to thank my mentor Dr. Heather Lipford and the members of the Human & Computer Interaction Lab.

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